

Prevalence and risk factors of ecstasy use among college students in Astara, Islamic Republic of Iran

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معدّل الانتشار وعوامل الخطر تعاطي "إكستاسي" بين طلبة الجامعة في أستارا، جمهورية إيران الإسلامية
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الخلاصة: كشف الباحثون عن معدّل انتشار وعوامل الخطر لتعاطي مادة ميثلين ديوكسي ميثامفيتامين "إكستاسي" لدى طلاب جامعة أستارا، وهي مدينة تقع على الحدود الشمالية من جمهورية إيران الإسلامية. فأجروا مسحاً عرضياً باستبيان شمل 1226 طالباً، وتبين أن معدّل تعاطي "إكستاسي" في أي وقت من الحياة 5.6% وأن معدّل انتشار تعاطي مخدرات أخرى في أي وقت من الحياة، والتي يغلب أن تكون الأفيون والحشيش 4.6%. وكان واحد من كل خمسة من الطلاب (21.8%) من المدخنين الحاليين للسجائر، وكان 24.8% منهم قد تعاطى الكحول في فترة ما من حياته. وبعد إجراء التحوف اللوجستي وجد الباحثون أن العوامل التي تؤثر على تعاطي "إكستاسي" في أي وقت من الحياة هي تعاطي المخدرات الأخرى، ومعاورة الكحول في أي وقت من الحياة، والتدخين في الوقت الراهن للسجائر، والعيش وحيداً أو مع الأصدقاء. وينبغي تنفيذ برامج الوقاية المستهدفة في جميع الكليات.

ABSTRACT We determined the prevalence and risk factors for 3,4-methylenedioxy-methamphetamine (MDMA, "ecstasy") use among college students in Astara, a northern border city of Iran. In a cross-sectional questionnaire survey of 1226 students, the lifetime prevalence of ecstasy use was 5.6%. The life-time prevalence of use of other drugs, mostly cannabis and opium, was 4.6%. A fifth of students (21.8%) were current cigarette smokers and 24.8% had ever used alcohol. After logistic regression, the factors influencing ever use of ecstasy were ever use of other drugs, ever use of alcohol, current cigarette smoking and living alone or with friends. Targeted prevention programmes should be conducted in all colleges.

Prévalence et facteurs de risque de consommation d'ecstasy chez les étudiants d'Astara (République islamique d'Iran)

RÉSUMÉ Nous avons déterminé la prévalence et les facteurs de risque de consommation de MDMA (3,4-méthylène-dioxy-méthylamphétamine, ou « ecstasy ») chez les étudiants d'Astara, une ville située à la frontière du nord de la République islamique d'Iran. Une enquête transversale par questionnaire réalisée auprès de 1 226 étudiants a montré que la prévalence de la consommation d'ecstasy au cours de leur existence était de 5,6 %. Celle d'autres drogues, principalement de cannabis et d'opium, était de 4,6 %. Un cinquième des étudiants (21,8 %) fumaient des cigarettes au moment de l'étude et 24,8 % avaient déjà bu de l'alcool. D'après la régression logistique, les facteurs qui influencent la première prise d'ecstasy sont le fait d'avoir déjà consommé d'autres drogues, d'avoir déjà consommé de l'alcool, de fumer des cigarettes et de vivre seul ou avec des amis. Des programmes de prévention ciblés devraient être menés dans tous les établissements universitaires.

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Introduction

“Ecstasy” is a methamphetamine derivative (3,4-methylenedioxy-methamphetamine or MDMA) that has become increasingly popular in the past 2 decades as a recreational drug often associated with the dance club subculture [1]. Increasing use among adolescents and young adults, as well as reports of potential neurotoxicity, has prompted a number of studies of ecstasy users throughout the world. In the United States of America (USA) Pope et al. reported that recreational drug use among New England college undergraduate students fell from 1969 to 1999, except for ecstasy use, which rose from 2.8% in 1997 to 4.7% in 1999 [2]. Further studies reported the prevalence of ecstasy use among college students as 4% in Turkey [3], 4%–18% in the United Kingdom [4–6] and 6%–24% in the USA [7–9]. The “Monitoring the future” study reported a rising use of ecstasy among Michigan college students from 3.8% in 1989 to 4.6% in 1997 and 6.8% in 1998 [10].

Despite anecdotal evidence that ecstasy use is becoming more prevalent in developing countries, there are limited data from these countries. Studies have shown a relationship between ecstasy use and personal characteristics, social factors and polydrug use but we would not expect that different societies have different high-risk groups [1,3,7,8,11,12].

In the Islamic Republic of Iran alcohol and drug use are prohibited for religious reasons and drug trafficking is the leading cause of imprisonment. However, the country has a high proportion of young people in the population, more than 4 million of whom are college students. Astara is the northernmost city of Guilan province, on the border between the Islamic Republic of Iran and Azerbaijan. Because of its geographic position, the area may be an important route

for drug trafficking across central Asia. Certainly there are a number of case reports from emergency wards of Guilan hospitals about the toxic effect of ecstasy use. Until now, no study on ecstasy use has been carried out in the Islamic Republic of Iran. Thus, the aim of this paper was to describe the prevalence of ecstasy use and its risk factors among college students in Astara.

Methods

We conducted a cross-sectional study in 2005 of a representative sample of college students at the Astara branch of the University of Azad. This research was approved by the ethics committee of Guilan University of Medical Sciences.

Sample

Stratified random sampling was used. Stratification was done by university department and sex. The sample size was estimated as 1380, using the proportion of ecstasy use among college students in Turkey of 4% [3] and based on a total number of college students in Astara of 3687.

Data collection

We visited schools and described the aims of the study. Students were briefed in advance and participation in the study was voluntary. The questionnaire was adapted from the questionnaires used in “Monitoring the future” projects in the USA [10] and the European School Survey Project on Alcohol and Other Drugs [13]. The questionnaire was translated into Farsi by the authors and translated back into English by another translator, so that discrepancies from the original questionnaire could be corrected. The questionnaires were given to a small sample of students in a pilot study to ascertain any difficulties with the questions.

The questionnaires were administered to 1380 students by a trained research team in the university. Care was taken to ensure that no university staff were present during the administration of questionnaires in order to increase the accuracy of responses. The survey was carried out on the day when final semester examinations were held, in order to minimize absenteeism. Students answered questions anonymously and put them in a common class box.

The questionnaire included questions about demographic characteristics (age, sex, marital status), father and mother's education level, academic performance, current residential status as a student (living in dormitory, living alone/sharing with friends or living with family), family status [father and mother living together, father and mother divorced, other (under guardianship of relatives or orphanage)], social contacts (frequent attendance at club and friends' parties) and use of other illegal drugs, cigarettes and alcohol.

Use of ecstasy and other drugs was defined as never used or ever used (lifetime). Ever use of ecstasy was divided into use within the previous year and within the previous month. Use of alcohol was divided into never used or ever used, with ever use divide into regular use (at least once/week) and irregular use (less than once/week). Cigarette smoking was defined as current (smoked any cigarettes in the previous 30 days) or not current. A later set of questions dealt with drug and ecstasy use, such as the age of first use, to show the inconsistency rate as an index of reliability.

Analysis

All the factors related to ecstasy use were categorical variables. Therefore, to assess the association between categorical variables and the outcome variable ecstasy use, chi-squared tests were performed. Finally,

all these variables were entered as predictors in a logistic regression model where ecstasy use was the dependent variable. Statistical analysis was done using SPSS, version 11.5 software and the significance level was $P < 0.05$.

Results

From 1380 students available on the day, 1226 (88.8%) responded; 657 (53.6%) were male and 569 (46.4%) were female, with a mean age of 24.2 [standard deviation (SD) 3.5] years, range 18–46 years.

A total of 69 students reported ever use of ecstasy, a lifetime prevalence of 5.6%; 51 of them (73.9%) had used ecstasy within the previous month and 18 had used it within the previous year. Ecstasy was a new drug in the Islamic Republic of Iran at the time of the study and we did not expect students to report ecstasy use from more than 1 year ago.

The lifetime prevalence of use of other drugs (excluding alcohol and tobacco) was 4.6% (57 students). The most common substances used were cannabis and opium. The mean age of starting other drug use was 18.6 (SD 2.8) years and half of students started drug use aged < 20 years.

In this study 267 (21.8%) students were ever smokers of cigarettes, 240 (19.6%) of whom were current cigarette smokers and 217 students regularly smoked at least 1 cigarette per day. The mean age of starting cigarette smoking was 15.2 (SD 2.1) years. A majority of ecstasy users (78.3%) had ever smoked cigarettes.

A total of 305 (24.8%) students reported ever use of alcohol, 50 (16.4%) of whom had used alcohol once or more per week and 255 used it occasionally.

The use of ecstasy by demographic characteristics is shown in Table 1. The lifetime

Table 1 Ever use of ecstasy by college students in Astara city (n = 1226) by selected demographic characteristics

Variable	Total	Ecstasy use				P-value
		Yes		No		
		No.	%	No.	%	
Sex						
Male	650	48	7.4	602	92.6	0.006
Female	553	20	3.6	533	96.4	
Age (years)						
< 25	884	58	6.6	826	93.4	NS
25–30	291	9	3.1	282	96.9	
> 30	41	1	2.4	40	97.6	
Marital status						
Single	832	43	5.2	789	94.8	0.04 ^a
Married	323	8	2.5	315	97.5	0.001 ^b
Widowed or divorced	11	5	45.5	6	54.5	0.001 ^c
Current residential status						
Dormitory	105	7	6.7	98	93.3	0.01 ^b
Alone or sharing with friends	324	41	12.7	283	87.3	
With family	770	18	2.3	752	97.7	
Family status						
Lives with parents	934	48	5.1	886	94.9	NS
Lives with father or mother	217	14	6.5	203	93.5	
Other	38	4	10.5	34	89.5	
Ever used other drugs						
Yes	56	39	69.6	17	30.4	< 0.001
No	1164	29	2.5	1135	97.5	
Ever used alcohol						
Yes	304	57	18.8	247	81.3	< 0.001
No	917	10	1.1	907	98.9	
Current cigarette smoker						
Yes	240	21	8.8	219	91.3	< 0.001
No	985	48	4.9	937	95.1	
Attends friend's parties						
Yes	771	59	7.7	712	92.3	0.001
No	453	10	2.2	443	97.8	
Academically successful						
No (low score)	284	33	11.6	251	88.4	< 0.001
Yes	913	36	3.9	877	96.1	

Table 1 Ever use of ecstasy by college students in Astara city (n = 1226) by selected demographic characteristics (concluded)

Variable	Total	Ecstasy use				P-value
		Yes		No		
		No.	%	No.	%	
<i>Father's educational level</i>						
Illiterate or < 5 grade	79	9	11.4	70	88.6	NS
5-9 grade	141	11	7.8	130	92.2	
9-12 grade	673	33	4.9	640	95.1	
> 12 grade	318	15	4.7	303	95.3	
<i>Mother's educational level</i>						
Illiterate or < 5 grade	132	11	8.3	121	91.7	NS
5-9 grade	265	19	7.2	246	92.8	
9-12 grade	617	27	4.4	590	95.6	
> 12 grade	199	12	6.0	187	94.0	

*Significant difference between groups 1 and 2; *Significant difference between groups 1 and 3; †Significant difference between groups 2 and 3.

Data on ecstasy use were missing in some categories.

NS = not significant.

prevalence of ecstasy use among our sample of students was significantly associated with sex (male), marital status (single or widowed/divorced), frequent attendance at friend's or club parties, academic performance (low academic grade; mean score < 12 in previous semesters), current residential status (alone or sharing with friends) and use of other substances (ever used other drugs, ever used alcohol and currently smoked cigarettes). There was no relationship between age (< 25 years), ecstasy use and mother's or father's educational level or family status (Table 1).

After adjusting for the confounding effects of independent variables with logistic regression analysis, ever use of other drugs [odds ratio = 30.7, $P < 0.0001$], ever use of alcohol (odds ratio = 8.9, $P < 0.001$), currently smoking cigarettes (odds ratio = 3.2, $P < 0.001$) and living alone/sharing with friends (odds ratio = 3.6, $P = 0.04$) remained important determinants of ever use of ecstasy (Table 2).

Discussion

Our results reflect a high degree of lifetime ecstasy use among college students in the northern boundary region of the Islamic Republic of Iran (5.6%). We believe that, because of its geographic position, Astara may be an important route for ecstasy trafficking between the Islamic Republic of Iran and Azerbaijan, but we have not found any published studies about ecstasy use in Azerbaijan for comparison.

In the present study, marital status (single or widowed/divorced) and sex (male) were associated with ecstasy use, as reported in previous studies [1,7,11,14-18]. In these studies ecstasy use was more prevalent among males, older age and single or divorced subjects. We also found a higher use of ecstasy among students with poor academic performance and this agrees with some previous studies in other countries [1,7,11,12,14], although other studies have not shown any effect of academic success

Table 2 Determinants of ever use of ecstasy among college students in Astara city

Variable	Odds ratio (95% CI)	P-value
<i>Ever used other drugs</i>		
No	1	
Yes	30.7 (13.2–71.4)	< 0.001
<i>Ever used alcohol</i>		
No	1	
Yes	8.9 (3.7–21.1)	0.001
<i>Current cigarette smoker</i>		
No	1	
Yes	3.2 (1.7–12.1)	0.001
<i>Current residential status^a</i>		
With family	1	
Alone or sharing with friends	3.6 (1.5–12.9)	0.04

^a"Dormitory" category was excluded as there was no significant difference from "with family" category in logistic regression analysis.

CI = confidence interval.

on ecstasy use [19,20]. In our study, however, none of these factors showed an association with ecstasy use after adjustment with logistic regression analysis.

Family status and level of education of parents had no effect on ecstasy use by students in our study. Indeed, it seems that ecstasy use had no socioeconomic pattern in our population and was not associated with specific groups. This finding disagrees with a similar study in Turkey, which found that higher educational background of the mother was a factor affecting increased use of ecstasy [1].

In the present study students who were supervised less by their families (living alone or sharing with friends, attending friend's parties) were more likely to experiment with ecstasy use, as reported in other studies [1,7,12,17,18]. Living alone/sharing was still a risk factor after regression analysis. It has been observed that if new friends, relationships and habits are not supervised sufficiently, young people can pick up harmful habits more easily [18]. A national

study of college students in the USA found that ecstasy use was higher among students who lived in college dormitories [18], but in our study living alone or sharing a home with friends were more important factors than living in dormitories.

After adjusting for confounding effects in logistic regression analysis, ever use of other drugs, ever use of alcohol, current cigarette smoking and living alone/sharing with friends were the most important determinants of ever use of ecstasy. The lifetime prevalence of ever use of other drugs in this study was 4.6% and 57/69 of ecstasy users, more than 80%, had ever used other drugs. We believe our results support the theory of polydrug use for ecstasy users that has been highlighted in other studies [1,3–8,11,14,15,17]. Using one substance possibly makes obtaining other substances easier. Several studies conducted on this issue revealed similar results [21–24]. The lifetime prevalence of other drug use in this study was lower than in previous studies in the Islamic Republic of Iran [25–27].

Our study was cross-sectional, therefore inferences about causality are limited, but, according to the reported time of starting use of drugs, our results suggest a relatively typical progression in the pattern of drug use. More than 70% of ecstasy users in our study experimented first with tobacco. Adolescents' experimenting with tobacco puts them at high risk of becoming users of other substances. This also offers an opportunity for early action through prevention programmes [14].

The results should be interpreted in the context of certain limitations. The collected data were self-reported and our study probably underestimated the extent of ecstasy use in college students. The validity of answers in studies about illegal behaviour is dependent on respondents trusting that their responses will not result in negative consequences. For this reason, it was made clear to the students that participation was voluntary, the relevance of the study was explained and they were assured that their responses would remain anonymous. Similar surveys have been widely used and are considered valid in examining substance use [28–31]. For some questions the missing data and nonresponse rate reached 10%. Furthermore, the study sample consisted of college students and therefore may not be representative of the wider population.

Conclusions

Since most ecstasy users began their careers with use of tobacco, it seems logical to focus prevention programmes on reduction of smoking, hoping that it will also reduce the use other substances. We must sensitize families about their children's smoking and ask them to increase their supervision of new friends, relationships and habits. In this study, students' source of drugs and ecstasy was not determined and therefore future studies should focus on finding the sources of illegal drugs in order to target interventions. Finally, we recommend that scientifically proven and targeted prevention programmes such as life-skills training programmes [32,33] be implemented in universities in the Islamic Republic of Iran.

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The Regional Advisory Panel on Impacts of Drug Abuse (RAPID)

The Regional Advisory Panel on Impacts of Drug Abuse (RAPID) was established by the World Health Organization (WHO) Eastern Mediterranean Regional Office in 2002 to review the current situation in the Region with regard to substance abuse, to determine the key elements of a strategic plan of action and to advise WHO on the ways and means of achieving its objectives. Its establishment reflects recognition of substance abuse as a growing problem in the Region, which is one of the most important transit areas of the world for illicit drugs.

Further information on the RAPID is available at: <http://www.emro.who.int/mnh/rapid.htm>