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Patterns of drug use among young men in Piedmont (Italy)

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Abstract

Increasing alarm is shown regarding patterns of polydrug use among young people, particularly regarding recreational drugs. Prevalence of recreational drug usage in Europe is not clearly defined, varying for ecstasy, from 0.2% (Finland, 1995) to 9.2% (UK, 1995) and suggesting a tendency to increase in the last years. The aim of this study is to present patterns of polydrug use among a sample of the general population of young males in Piedmont (Northern Italy), focusing particularly on ecstasy consumption. A cross sectional study was carried out between September and November 1998 on a continuous sample of 3274 18-year-old conscripts. A self-administered anonymous questionnaire on socio-demographic characteristics and substances use was submitted during routine tests. Results showed that the overall lifetime prevalence of drug use is 36.6%; prevalence of polydrug use is 30% and the more frequently associated drugs are LSD, cocaine, inhalants and ecstasy. One hundred and forty five (4.6%) subjects reported having taken ecstasy at least once in their life; 20 of the 145 (13.8%) suffered from negative effects and three (2%) presented to a hospital or to a physician. The risk of ever taking ecstasy is inversely related to father's education, with a trend that is quite similar to that of heroin consumption but that is different from the trend for cannabis. In conclusion the four major results of this study are: (i) a prevalence of drug consumption similar to other European estimates, with a clear tendency to polydrug use; (ii) for ecstasy, a very high association rate with other substances; (iii) the moderately high prevalence of self-reported symptoms, and (iv) a social distribution of use similar to the one observed for heroin. This last consideration suggests that a high level of attention and further research should be addressed to the natural history of ecstasy use. © 2001 Elsevier Science Ireland Ltd. All rights reserved.

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1. Introduction

Increasing alarm is shown by the general population, the media and Public Health professionals regarding patterns of polydrug use among young people and the increase of recreational drugs' consumption, particularly ecstasy and its related health risks (intoxication, traffic accidents, addiction) (Canino et al., 1993; Di Palma, 1999; Konings et al., 1995; Matsushita et al., 1996; Pickering and Stimson, 1994; Rezza et al., 1992; Webb et al., 1996). To assess the real dimension of this problem we need two indicators: the frequency of use among general population and the impact on health.

The prevalence of synthetic drug users can be considered as the best indicator of the dimension of this phenomenon, but its measurement is complex. An indirect assessment can be accomplished starting from the number of people who are treated by drug addiction services for synthetic substances' use. In Italy, during 1998, about 11% ($\approx 15\,000$) of drug addiction Public Services' clients were treated for non-opioid drug use (Italian Health Ministry, 1999). This number appears to be a large underestimate, it suggests that users do not resort to public services, perhaps because the use of such drugs is not perceived as a serious problem (Griffiths et al., 1997). Another estimate comes from data on substance confiscations, but these indicators are scarcely reliable, as they depend on law variations and police efficiency (Davoli et al., 1992). Since indirect

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estimates are not satisfactory, we need estimates at a population level.

International reports can be useful to outline the phenomenon: one study in the USA found that 59% of a sample of high school students took drugs on a regular basis. The most frequently used substances were cannabis (20%), LSD (18%), amphetamines (19%), ecstasy (13%), magic mushrooms (16%) and anti-butyl nitrates (15%) (Kandel and Davies, 1996). In the UK, among 9126 teenage students surveyed during 1995, the proportion of lifetime-users of cannabis was 43.6% among males (m) and 38.0% among females (f), while the figures for amphetamines (m = 14.5%, f = 12.3%), LSD (m = 17.0%, f = 12.2%), MDMA (m = 9.2%, f = 7.3%), cocaine (m = 2.8%, f = 2.4%), crack (m = 2.7%, f = 2.2%) and heroin (m = 1.7%, f = 1.5%) are lower (Miller and Plant, 1996).

Focusing on ecstasy consumption some European surveys in varying age groups show a high variability: the estimated prevalence was 4–5% in Belgium in 1994, 0.5% in Denmark, 0.4% in Sweden and 0.2% in Finland in 1995 (Calafat, 1997).

Some other studies suggest an increase over time of the prevalence of ecstasy use and associated risks, especially in younger age groups (Adlaf et al., 1996; Gamella et al., 1997). In general the scientific literature suggests a huge geographical variability, a general increasing temporal trend and solid evidence of polydrug use among young people.

However, the quality of these measures could be questioned: most of them come from school surveys, which do not take into consideration people out of school and could consequently be biased. We cannot define the size of this bias but, given that substance use is more frequent among lower educated groups, manual workers and unemployed (Manganiello, 1978; Pierce and Fiore, 1989; Nelson and Emont, 1994; Ponti and Faggiano, 1994), it is likely to be considerable.

The aim of this paper is to present patterns of polydrug use among a sample of young males from the general population in Piedmont (a North-western industrialised region of Italy with 5 million inhabitants), focusing especially on ecstasy consumption and its reported effects on health.

2. Material and methods

All 18 year-old Italian men must undergo a compulsory conscription medical examination: the military district in Turin examine conscripts from the Western and Central part of Piedmont region and Aosta valley. The total number of 18-year-old living in the area of the study was about 18 000 people in 1998.

A cross sectional study was carried out in the Military District of Turin from 21/9/98 to 7/12/98: a sample

of 3274 was selected among 5615 young men going through the examination. Out of the 120 subjects examined daily, about 70 were randomly sampled on the basis of the seat they occupied in the meeting room.

The use of heroin, cocaine, cannabis in the form of marijuana and hashish, ecstasy (described as such when sold), LSD, inhalants (poppers), were collected by means of a self administered, multiple choice, strictly anonymous questionnaire containing questions about regular (on average once or more a week) and occasional use (sometimes in the year).

Additional questions were focused on social and demographic data, on tobacco and alcohol consumption. Four dummy questions about the use of a fictitious drug called 'knock' were also included. A specific section investigated the characteristics of the use of ecstasy and the symptoms experienced after consumption. In particular there was a multiple choice question addressing symptoms complained after ecstasy consumption (weakness, anxiety, depression, loss of memory, diarrhoea, nausea/vomiting, heat waves, hallucinations, convulsions), followed by open question to report other symptoms (Gamella and Alvarez Roldan, 1997; Topp et al., 1999).

The questionnaire, together with an information letter, was given to conscripts by trained surveyors who illustrated the scope of the survey to the selected subjects. The conscripts were particularly reassured about the complete anonymity of the whole procedure: the questionnaire was strictly anonymous, no army staff member was allowed into the enquiry room, completed questionnaires were deposited by conscripts into a box and removed after each section.

All the 3274 recruited subjects completed the questionnaire. One hundred and five questionnaires were excluded: 50 (1.5%) for being incomplete and 55 (1.7%) for meeting exclusion criteria, such as the use of 'knock', the undetailed statement of substance use, and the inconsistency in the route of administration (e.g. tablets for heroin). Finally the total sample under study was 3169 subjects, 96.8% of the original sample.

To describe the distribution of variables under study, proportions and 95% confidence intervals were calculated. Patterns of polydrug use were described by mean of a cross-frequency table. To study the factors affecting the risk of consumption of substances, logistic regression models were fitted, in which the use of substance was the dependent variable, and occupation, father's education and size of town of residence were the independent ones (Clayton and Hills, 1993). Prevalence Odds Ratios (POR) are presented as results and 95% confidence intervals were estimated but not shown.

In order to investigate the relation between the pattern of ecstasy consumption and reported adverse effects on health, relative risks and 95% confidence intervals were estimated (Armitage and Berry, 1987).

3. Results

The place of residence of the subjects under study was a town of over 10 000 inhabitants in 55.9% of cases; most subjects (97.7%) lived with their parents and were students (60.7%) (Table 1). Forty-seven percent were smokers; wine (4.0%), beer (5.9%) and spirits (6.3%) were drunk on a daily basis (Table 2).

The overall lifetime prevalence of illicit drug use is 36.6%. Out of the total sample, 33.7% used cannabis, while 'recreational drugs', such as ecstasy, LSD, co-

Table 1
Socio-demographic characteristics of the sample under study ($n = 3169$).

Characteristic	<i>N</i>	%	95% CI
<i>Place of residence</i>			
Main town (Torino)	807	25.5	23.9–26.9
Town > 10 000 inhabitants	962	30.4	28.7–31.9
Town ≤ 10 000 inhabitants	859	27.1	25.6–28.7
Village	486	15.3	14.1–16.6
<i>Occupation</i>			
Student	1925	60.7	59.1–62.4
Employed	971	30.6	29.0–32.6
Unemployed	263	8.3	7.3–9.3
<i>Father's educational level</i>			
None	84	2.7	2.1–3.2
Primary school	571	18.0	16.6–19.4
Secondary school	1148	36.2	34.6–37.8
High school	991	31.3	29.7–32.9
Degree	293	9.3	8.6–10.3

Table 2
Prevalence of substance use ($n = 3169$)

Substance use	<i>N</i>	%	IC 95%
<i>Smoking</i>			
Ever	1514	47.4	45.6–49.1
<i>Wine</i>			
Occasionally	1689	53.3	51.6–55.0
Daily	128	4.0	3.4–4.7
<i>Beer</i>			
Occasionally	2191	69.1	67.5–70.8
Daily	186	5.9	5.1–6.7
<i>Spirits</i>			
Occasionally	1682	53.1	51.3–54.8
Daily	200	6.3	5.5–7.2
<i>Drugs (lifetime)</i>			
Cannabis	1069	33.7	32.1–35.3
Inhalants	224	7.1	6.4–8.1
Cocaine	154	4.9	4.2–5.7
Ecstasy	145	4.6	3.9–5.4
LSD	115	3.6	3.1–4.4
Heroin	25	0.8	0.5–1.2
All drugs together	1159	36.6	34.9–38.3

caine and inhalants, were used, on average, by about 5% of young men and heroin by 0.8% (Table 2).

Table 3 shows the association of substances reported by the subjects included in the study: among the consumers of each substance the prevalence of consumption of the others are shown. Polydrug users represent 30% of all consumers (data not shown). Cannabis appears to be the most 'shared' drug, but at the same time the cannabis user appears to be the least interested in taking other drugs (exclusive use = 79.4). Heroin appears to be the least requested by consumers of other drugs, with medium values of 'exclusivity'. Ecstasy data show a frequent association with other substances: only 9% of ecstasy consumers did not take other drugs.

The multivariate analysis (Table 4), examining the factors affecting the risk of consumption of the substances under study, shows a general protection given by the paternal higher educational levels against all the substances except ecstasy (ns) and heroin. Apart from cannabis, very low paternal education seems to be at risk for prevalence of all drugs. Being employed is another risk factor for illicit drug use, (except for cannabis, $RR = 1.03$ ns); the level of association is higher for heroin ($RR = 8.4$), intermediate for ecstasy ($RR = 2.6$), cocaine ($RR = 2.5$) and LSD (2.2), and lowest for inhalants ($RR = 1.43$). The size of town of residence is directly related to the risk of taking drugs.

Usual place of consumption varies widely according to substances: for ecstasy, LSD and inhalants it is mainly at discos, for cannabis and cocaine is mainly at private parties, while for heroin no clear preferences are shown (Table 5).

Regarding ecstasy, 145 subjects reported having ever used it. Among them, the consumption was regular for 16.5%, occasional for 31.6% and 51.9% had used it only once. The average age of first use was 16 years (data not shown). Twenty ecstasy users (13.8%) reported having suffered from negative effects after ecstasy intake (Table 6), and three of them (2.0%) presented to a hospital or a physician after the intake. The risk of adverse effects seems to be inversely related to the declared frequency of consumption (ns) and there appears to be no association with the level of polydrug using (Table 7).

4. Discussion

A cross-sectional survey has been conducted on a random sample of about 17.6% of the 18-year-old population of Piedmont and Aosta Valley in order to describe the patterns of use of illicit drugs: these Italian regions are very close, for history and traditions, to other European countries. The validity of self administered questionnaires has been confirmed by many authors (Bale, 1979; Benson and Holmeberg, 1985; Rogers et al., 1998), the major limitation of the study

Table 3
Association of substances. For each substance reported in rows, the prevalence of users of other substances is reported in columns. In bold, exclusive use

Drug used	Associated drugs						Mean no. of substances used (SD)
	Cannabis (%)	Inhalants (%)	Cocaine (%)	Ecstasy (%)	LSD (%)	Heroin (%)	
Cannabis (<i>n</i> = 1069)	79.4	19.6	13.8	12.3	10.3	2.0	1.6 (1.1)
Inhalants (<i>n</i> = 224)	93.3	6.7	36.6	39.7	34.8	5.8	3.1 (1.3)
Cocaine (<i>n</i> = 154)	95.5	53.2	4.5	50.6	44.8	11.7	3.6 (1.3)
Ecstasy (<i>n</i> = 145)	91.0	61.4	53.6	9.0	53.1	9.7	3.7 (1.3)
LSD (<i>n</i> = 115)	95.7	67.8	60.0	67.0	4.3	11.3	4.0 (1.3)
Heroin (<i>n</i> = 25)	84.0	52.0	72.0	56.0	52.0	16.0	4.2 (1.9)

Table 4
Factors affecting ever use of substances under study: number of users/non users, prevalence odd ratios (POR); factors in analysis were adjusted for each other^a

Factors	Ecstasy		Heroin		Cocaine		Inhalants		Cannabis		LSD	
	<i>N</i> y/n	POR	<i>N</i> y/n	POR	<i>N</i> y/n	POR	<i>N</i> y/n	POR	<i>N</i> y/n	POR	<i>N</i> y/n	POR
<i>Occupation</i>												
Student	58/204	1	4/1957	1	64/1897	1	127/1834	1	674/1288	1	51/1912	1
Employed	71/863	2.63* ^b	18/1916	8.35*	71/862	2.50*	77/857	1.43*	304/630	1.03	49/885	2.17*
Unemployed	14/248	1.70	2/260	2.51	18/245	2.03*	19/244	1.11	81/180	0.94	14/247	2.06*
<i>Father's education</i>												
Degree	11/280	1	1/291	1	15/277	1	19/273	1	122/170	1	15/277	1
High School	39/952	1.05	6/985	2.29	43/948	0.86	84/908	1.33	361/629	0.98	33/958	0.72
Secondary School	50/1092	1.04	5/1143	1.25	49/1099	0.76	68/1080	0.88	376/772	0.84	31/1119	0.52*
Primary school	31/540	1.18	7/564	3.02	29/542	0.82	38/533	0.96	156/415	0.65*	23/548	0.72
None	10/74	2.29	5/79	11.27*	13/71	2.28*	8/76	1.30	28/56	0.85	10/74	1.96
<i>Town of residence</i>												
Main Town	38/769	1	7/780	1	46/761	1	66/741	1	289/518	1	29/778	1
Town > 10 000 inhabitants	51/911	1.04	7/953	0.48	50/912	0.90	72/890	0.93	331/631	0.97	42/920	1.36
Town < 10 000 inhabitants	31/829	0.70	4/854	0.34	32/827	0.63	57/802	0.81	297/561	0.98	30/829	1.08
Village	19/466	0.63	3/485	0.32	19/466	0.55	24/462	0.57*	130/358	0.69*	12/473	0.64

^a *N* y/n, number of users/not users.

^b *, statistically significant results.

Table 5
Percentage distribution of usual place of drug consumption among the sample under study

	Disco	Private parties	Home	Pub	Stadium/concerts	School/working place	Any
Cannabis	7.2	29.4	6.9	4.3	3.6	7.2	41.4
Inhalants	24.6	22.7	5.9	5.9	2.0	8.4	30.5
Cocaine	12.4	35.8	14.6	2.9	0.7	2.2	31.4
Ecstasy	63.5	5.6	8.0	2.4	1.6	0.8	25.3
LSD	35.6	18.8	3.0	1.0	3.0	2.0	36.6
Heroin	27.3	27.3	22.7	0.0	0.0	0.0	22.7

seems to be the restriction to the 18-year-old male population but, by using information from other studies (e.g. Gamella and Alvarez Roldan, 1997) about age class distribution and male–female ratio, the whole prevalence could be easily extrapolated. Moreover, these data can be useful to estimate unbiased time trends in drug consumption.

The setting of the data collection (a military district) could be a critical point in the estimation of bias; nevertheless, the low percentage of incomplete questionnaires, especially for critical questions that the subjects felt free to answer (see Section 2), the use of some dummy variables to exclude false answers, and the data quality control, favour the reliability of our data.

The validity of the study estimates could be confirmed by the comparison between the measured prevalence of heroin use (0.8%) with the prevalence of clients of Drug Abuse Services of our region in the 15–19 years age class, for 1997 (0.2%) (Salamina et al., 1998). Since addicts represent a hidden population and real prevalence is estimated nearly three times that registered by Drug Abuse Services, and that the population under study is relatively young (especially considering that the

mean age of access to the Drug Abuse Services is 24 years; Faggiano, unpublished data), the results on heroin consumption are similar to the expected ones.

Notwithstanding the considerations on validity, the major results of our study are:

1. Data on prevalence of drug consumption are similar to other European estimates: approximately 37% have used substances (mainly cannabis) at least once in their life, whereas about 1% of the people interviewed used heroin at least once. The prevalence of ecstasy use was 9.2% in a school based survey in Great Britain in 1995 (Miller and Plant, 1996), while it ranged from 0.6 to 1.8% in a school based survey in Ontario (Adlaf et al., 1996). The determinants of ecstasy use may also be quite similar in different European communities.
2. Ecstasy appears to be the most notable drug as regards to consumption in a specific place: 63.5% of the interviewed said they used it in a disco. Other drugs show a similar pattern, although on a smaller scale, such as LSD used by 36% in a disco, and cocaine used by 35.8% at private parties. The least place-selective drug appears to be cannabis, which was taken indifferently by 41.4%, whereas heroin appears to be consumed mainly in private contexts. Our data show that about 30% of consumers are polydrug users. Ecstasy consumers are very likely to use it in conjunction with other substances: the usage associated with cannabis is 91%, and with inhalants and cocaine is very frequent (61 and 54%, respectively). On the other hand, 79% of consumers of cannabis use this drug in an exclusive mode, whereas heroin is used in an intermediate way, being used exclusively by 16% of users, and is generally associated with all other studied substances. With the exception of cannabis, the average number of substances used is generally very high: for ecstasy it is 3.7, which seems particularly interesting for studies of the effects on health of ecstasy.
3. The third interesting result is the social distribution of the risk of the use of such substances. The OR's, adjusted by occupation and size of town of residence, suggest two different patterns of risk of consumption: especially for cannabis, but also for cocaine, inhalants and LSD, higher social category has higher prevalence, whereas, for heroin and for ecstasy, an opposite trend can be observed. Even considering the great differences in the size for OR's, the low association between the two consumptions and that early drug use is related to low social class (Faggiano, unpublished data). The similar social pattern for ecstasy and heroin suggests that the two behaviours could have similar determinants. Even though such a selected group of predictors could only ever hope to account for a small proportion of the variance in drug use for any drug

Table 6

Distribution of symptoms after consumption of ecstasy reported by ecstasy users ($n = 145$). Since more than one answer was allowed, 38 symptoms were reported by 20 subjects (percentages are based on individuals)

Symptom	<i>N</i>	%
Weakness	8	5.5
Anxiety	8	5.5
Depression	6	4.1
Loss of memory	3	2.7
Diarrhoea	3	2.0
Nausea/vomiting	3	2.0
Heat waves	3	2.0
Hallucinations	3	2.0
Convulsions	1	0.6
Total	38	13.8

Table 7

Risk of reported effects on health after ecstasy intake, by frequency of use and number of substances associated with ecstasy (univariate analysis)

	<i>N y/n</i> ^a	RR	95%CI
<i>Frequency of use</i>			
Once in life	8/34	1	–
Occasional use	11/58	0.84	0.37–1.91
Regular use	3/19	0.72	0.21–2.43
<i>Associated substances</i>			
None	8/45	1	–
1 or 2	6/36	0.95	0.36–2.52
3 or 4 or 5	9/41	1.19	0.50–2.85

^a *N y/n*: number of users/not users.

class, this suggestion needs to be analysed more deeply and considered seriously in view of its implications for further research and action.

4. The prevalence of self-reported toxic symptoms after using ecstasy is quite high (13.8%, $n = 20$); although most symptoms are minor, three subjects experienced hallucinations, one had convulsions and three presented to a physician. Another interesting result is the inverse correlation between adverse effects and health care need and frequency of use, suggesting that the first experience of adverse effects could stop the use, although this consideration is based on few subjects and not statistically significant. The relatively high frequency of symptoms seems to be useful and could be used in information campaigns to discourage people from using drugs and suggest the need to study further the risks on health (Topp et al., 1999).
5. Comparison between our results and Italian school-based data for 1999 (ESPAD, 1999), shows that, except for heroin, school-based prevalence data are underestimated. This is partly justified by the fact that subjects in the school survey are both male and female and are younger (15–16 years) than those in our study; furthermore ESPAD data refer to the whole country while our results are limited to Piedmont; nevertheless, the inconsistency of the data about heroin use (ESPAD = 4%) with our results (0.8%), and with Drug Abuse Services data for our Region (0.2%) (Salamina et al., 1998) suggests that this school survey could be biased.

In conclusion, this study represents an estimate of the prevalence and characteristics of drug use and supports the need for unbiased surveys to assess the size of the phenomenon and to plan actions.

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