

Received: 2014.07.23
Accepted: 2014.09.18
Published: 2014.XX.XX

Illegal Drug Use among Female University Students in Slovakia

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Statistical Analysis C
Data Interpretation D
Manuscript Preparation E
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Source of support: Cultural and Educational Grant Agency (CEGA/KEGA) of the Ministry of Education, Science, Research and Sport of the Slovak Republic, KEGA 007UKF-4/2012

Background: This study is focused on the issue of illegal drug use among female university students preparing to become teachers. The main aim was to determine the frequency of drug abuse in a group of young women (n=215, mean age 20.44 years).

Material/Methods: Using survey methods, we determined that 33.48% of female university students in Slovakia use illegal drugs and 66.51% of students have never used illegal drugs. Differences between these groups were determined using statistical analysis, mostly in 4 areas of survey questions.

Results: We determined that education of parents has a statistically significant influence on use of illegal drugs by their children ($\chi^2=10.14$; $P<0.05$). Communication between parents and children and parental attention to children have a significant role in determining risky behavior (illegal drug use, $\chi^2=8.698$, $P<0.05$). Parents of students not using illegal drugs were interested in how their children spend their free time (68.53%). We confirmed the relationship between consumption of alcohol and illegal drug use ($\chi^2=16.645$; $P<0.001$) and smoking ($\chi^2=6.226$; $P<0.05$). The first contact with drugs occurs most frequently at high school age. The most consumed "soft" drug in our group of female university students is marijuana.

Conclusions: Our findings are relevant for comparison and generalization regarding causes of the steady increase in number of young people using illegal drugs.

MeSH Keywords: **Drugs, Essential • Marijuana Smoking • Students • Women**

Full-text PDF: <http://www.medscimonit.com/abstract/index/idArt/892068>

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Background

Recently, illegal drug use has become an everyday reality. We have not yet fully realized how covertly they have entered our environment and what problems they bring. Next to alcohol and tobacco, other drugs are forcefully entering our lives; they are abused often by teenagers who wish to intensify the current state of joy and happiness. The drug will, at least for a while, allow users feel strong and to forget about disappointments, probably because the reality of life affected them more severely than expected and they have no other means of dealing with it. Some authors claim that the most probable causes of illegal drug use among young people may be: low self-esteem, peer pressure, examples of adults, psychological problems, boredom and curiosity, alienation, and biological predisposition [1]. The issue of illegal drug use is not confined to any particular age group. Use of illegal drugs is the number one public health problem for university students because it is the leading cause of preventable death and injury among students age 18–25 years [2,3]. During the past decade the use of marijuana has increased considerably among college and university students, whereas alcohol consumption has held relatively steady during the same period [4,5]. By means of this study we want to contribute to the fight against use of illegal drugs.

Material and Methods

The study was carried out at the Constantine the Philosopher University in Nitra, the fifth biggest city in Slovakia. The research group consisted of females studying teaching, because females are predominant in this field of the study. The number of female students was 215, aged 19–22 years (mean=20.44). We studied this group from 2 points of view: the group of students as a whole and 2 sub-groups. As a criterion for division into sub-groups, we used their answers to the questions asked in the questionnaire in which they confirmed use of any illegal drug. The students admitting use of illegal drugs were marked as group E (experimental, n=72; 33.48%), the students, who have never used an illegal drug were marked as group C (control, n=143; 66.51%). To obtain responses from students, we used anonymous questionnaires. We tried to avoid possible interference from irrelevant factors, for example, before an exam there is a bias because the students do not pay much attention to a questionnaire. The questionnaire contained 24 items, each of which offered multiple choice answers, out of which only 1 could be selected, which allowed expressing of ratio of agreement, or disagreement with the specified statement, or to present a neutral attitude. The questions were divided into 4 areas. The first area was aimed at obtaining basic information on students and select characteristics of their family environment (age, location of parental home, parents' education, communication with parents, understanding and support from

parents, parents' awareness about their children's free-time activities, and consumption of alcohol and tobacco by parents). In the second area, we determined the extent of sports activities of female students. The third area determined their attitudes to their male friends in 3 questions: "If your male friend used drugs, would you have abandoned him? Will you have committed treason or spying if you alert his parents or teacher to the illegal drug use? Would you be able to refuse an illegal drug if somebody (for instance some of your friends) offered it to you? The fourth area gathered information on opinions and attitudes of female about issues related to use of illegal drugs, their own illegal drug use experience (collecting information about drugs, places of most frequent contact of young people with drugs, time of first use, opinion on anti-drug activities, extent of consuming of alcohol and smoking, reasons for drug abuse).

Data analysis

For evaluation of answers we used Pearson's chi-square (χ^2) test of independence by which we measured statistical significance of differences between students who use and do not use illegal drugs. This test analyzes the null hypothesis, which expresses independence of variables. It means that knowledge of 1 of the variables cannot help to improve estimation of the value of another variable. If P-value is lower than the chosen level of significance (* P<0.05; ** P<0.001) then the null hypothesis is denied; the measured difference is too high for being only the consequence of random selection and it is therefore statistically significant. If a P-value is equal to or higher than the chosen level of significance, the null hypothesis cannot be denied, meaning that the measured difference may be the consequence of random selection and it is not statistically significant. For evaluation, the Microsoft Excel (Microsoft Office Excel 2003) software package was used.

Results

Characteristics of the family situation

Results of analysis of the first topic are shown in Table 1. We confirmed a significant relationship between using illegal drugs and the place of residence ($\chi^2=7.585$; P<0.05). We found that education of parents has statistical significance for their children using illegal drugs ($\chi^2=10.14$; P<0.05). A very high percentage of parents whose daughters used illegal drugs had a university degree (n=26; 31.32%). Communication between parents and their children and parents paying attention to their children plays an important role in risk-behavior (use of illegal drugs) of their children. We found substantial significant dependence ($\chi^2=8.698$; P<0.05). Most of the university women surveyed said they had excellent support, help, and understanding from their parents (n=60; 83.33%). We found a statistically

Table 1. Characteristics and family situation of female-students of experimental (E) and control (C) groups.

	E	C	Differences χ^2
	n= 72; 33.48%	n=143; 66.51%	
Age (in years)	20.44		
Home-place:			
City	n=49; 68.05%	n=69; 48.25%	7.585*
Country	n=23; 31.94%	n=74; 51.74%	
Parent education:			
Skilled workman/woman	n=15; 18.07%	n=21; 12.96%	10.14*
High school (with school leaving exam)	n=39; 46.98%	n=100; 61.72%	
University	n=26; 31.32%	n=27; 16.67%	
Communication with parents:			
Good	n=34; 47.22%	n=81; 56.64%	8.698*
Poor	n=13; 18.05%	n=8; 5.59%	
Understanding and support from parents:			
Good	n=60; 83.33%	n=136; 95.10%	5.643*
Poor	n=10; 13.88%	n=7; 4.89%	
Parent awareness about free-time activities:			
Periodical	n=27; 37.50%	n=98; 68.53%	18.667**
None	n=1; 1.38%	n=0	
Consumption of alcohol by parents:			
Periodic consumption of alcohol by mother	n=1; 1.44%	n=1; 0.07%	0.110
Periodic consumption of alcohol by father	n=7; 9.85%	n=6; 4.41%	
Parent's smoking:			
Mother	n=12; 17.39%	n=18; 13.13%	2.461
Father	n=25; 35.21%	n=33; 24.26%	

* P<0.05; ** P<0.001.

Table 2. Comparison of sports leisure activities between E and C group.

	E	C	Differences χ^2 , p<0.5
Sport's activities:			
no sport's activities	n=17; 23.61%	n=34; 23.77%	
more than 2 hour/week	n=32; 44.44%	n=45; 31.46%	5.768
less than 2 hour/week	n=18; 25.00%	n=57; 39.86%	

significant dependence between use of illegal drugs and understanding of parents in groups E and C ($\chi^2=5.643$, P<0.05). Parents of students who have never used illegal drugs were interested in how their children are spending their free time (n=98; 68.53%). In this parameter we confirmed significant dependence between the experimental and control groups ($\chi^2=18.667$; P<0.001). We also observed use of „legal drugs“ by parents. The most common response of both the experimental group and control group mothers was that they drink alcohol „only occasionally“ (n=39; 28.46%) or „rarely“ (n=60; 43.84%). Students from both groups most frequently answered that their fathers drank „only occasionally“. A statistical significance was not been detected between using illegal drugs

by students and alcohol drinking of their parents (mothers: $\chi^2=0.110$; P<0.05, fathers: $\chi^2=5.869$; P<0.05). The smoking of parents and using illegal drugs by their children has not show any statistically significant dependence (mothers: $\chi^2=2.461$; P<0.05, fathers: $\chi^2=3.676$; P<0.05). Female students using illegal drugs had grown in families where parents used to smoke daily (mothers: n=12; 17.39%, fathers: n=25; 35.21%).

Sport's activities

Results of the second range of issues are shown in Table 2 and Figure 1. There was no significant association between sports leisure activities and taking illegal drugs ($\chi^2=5.768$; P<0.05).

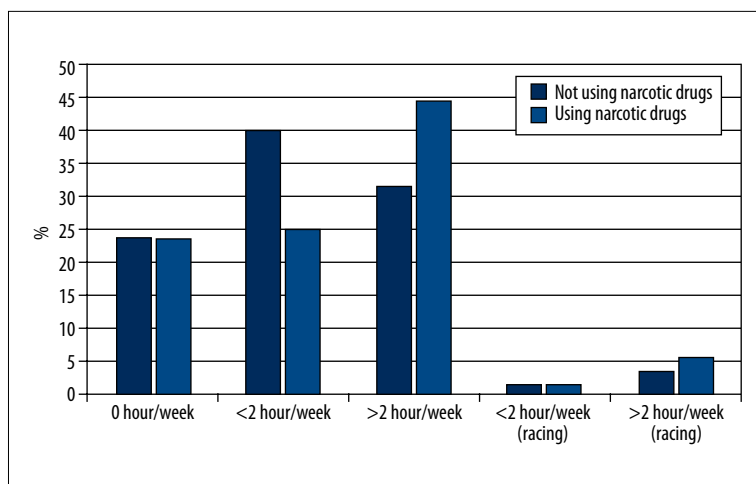


Figure 1. Comparison of percentage differences between drug using (E) and non-drug using students (C) depending on sports activities.

Table 3. Attitude of students (E and C group) to friends in relationship with taking drugs.

	E	C
If your boy/girlfriend takes a drug, will you break up with him/her?		
Yes	n=22; 30.55%	n=38; 25.16%
No	n=28; 38.88%	n=46; 30.46%
I do not know	n=22; 30.55%	n=67; 43.37%
Do you think, if you tell the parents of your boy/girlfriend they taking drugs, you betray him/her ?		
Yes	n=20; 27.77%	n=17; 11.88%
No	n=36; 50.00%	n=96; 67.13%
I do not know	n=16; 22.22%	n=30; 20.97%
Would you refuse a drug if your friend offers it to you to try it?		
Yes	n=20; 93.06%	n=17; 92.14%
No	n=36; 2.77%	n=96; 5.71%
I do not know	n=16; 4.16%	n=30; 2.13%

Attitude toward friends

Analysis results of the third range of issues are shown in Table 3. In this part we found out whether taking illegal drugs impacts relationships among friends. The student answers to the question about leaving their boyfriend who is taking drugs were equal. Responses „yes“ (n=22; 30.55%) and „no“ (n=28; 38.88%) have higher percentage in the E group of students. The response „I do not know“ was frequent in the C group of students (n=67; 44.37%). Students in the E group considered that telling the parents of their boyfriend that he is using illegal drugs is a form of betrayal (n=20; 27.77%). On the other hand, in the C group of students this response was about 16% less frequent.

Student views and attitudes about drug problems, experiences with drugs

Results on the fourth range of issues are shown in Table 4. Both study groups indicated that illegal drugs were most frequently

present at discos and at gatherings of friends. Almost the same opinion was observed for difficulty in obtaining illegal drugs. A significant association was detected between taking illegal drugs and alcoholism ($\chi^2=16.645$; $P<0.001$), as well as with smoking ($\chi^2=6.226$; $P<0.05$). Students had first used illegal drugs in high school (n=49; 70.40%) and 19.70% (n=14) of students reported that their first contact with illegal drugs was in elementary school. The most commonly used illegal drug is marijuana (cannabis) also called „soft“. The highest number of participants prefer this drug (n=72; 77.17%, Figure 2).

A significant association ($\chi^2=39.456$; $P<0.001$) was also detected between taking illegal drugs and source of information about drugs. The students who do not use illegal drugs have learned about illegal drugs at school (n=89; 44.95%), and the students who are taking illegal drugs learned about them largely from their friends (n=47; 43.92%). Few students in either group mentioned parents as a source of illegal drug information (E=4.16%, C=6.56%). We found differences in illegal drug awareness in Slovakia. While more than half students in

Table 4. Views and attitudes of students (E and C group) on drug problem, drug's experience.

	E		C		Differences χ^2
Where can young people come into contact with drugs most commonly:					
Party	n=4;	4.65%	n=6;	3.44%	
Disco	n=29;	33.72%	n=78;	44.82%	
Gathering of friends	n=49;	56.97%	n=84;	48.27%	
I do not know	n=0		n=5;	2.87%	
To get drugs near your home is:					
Easy	n=43;	59.72%	n=37;	26.00%	
Complicated	n=0		n=3;	2.11%	
I do not know	n=29;	40.27%	n=102;	71.83%	
How often do you drink alcohol:					
Regularly	n=4;	5.55%	n=0		
Occasionally	n=49;	68.05%	n=62;	43.35%	16.645**
Never	n=1;	1.38%	n=15;	10.48%	
How often do you smoke:					
Regularly	n=27;	38.02%	n=9;	6.30%	
Occasionally	n=10;	14.08%	n=2;	1.39%	6.226*
Never	n=11;	15.49%	n=125;	87.41%	
When did you take a drug the first time:					
During elementary school	n=14;	19.70%			
During high school	n=49;	70.40%			
At university	n=4;	5.63%			
Which drugs have you ever tried:					
Marijuana	n=72;	77.17%			
Hashish	n=18;	14.67%			
LSD	n=4;	3.25%			
Pervitin (methamphetamine)	n=9;	7.38%			
Cocaine	n=1;	0.09%			
Another opiate	n=1;	0.09%			
Ecstasy	n=12;	9.81%			
Volatile substances	n=2;	1.64%			
Sedatives	n=3;	2.43%			
Another substances	n=1;	0.09%			
Who did you get the most drug information from?					
Parents	n=3;	4.16%	n=13;	6.56%	
School	n=28;	26.16%	n=89;	44.95%	39.456**
Friends	n=47;	43.92%	n=26;	13.13%	
Drug awareness in Slovakia:					
Adequate	n=19;	26.38%	n=74;	52.48%	
Inadequate	n=34;	47.32%	n=32;	22.70%	16.897**
The most effective „antidrug“ activity:					
Chat with a treated and clean former drug user	n=59;	71.95%	n=106;	69.73%	1.233
Why did you take a drug the first time?					
Curiosity	n=59;	67.81%			
Improving mood	n=11;	12.64%			
To fit in with friends	n=8;	9.19%			
With legalization of marijuana:					
I agree	n=30;	41.66%	n=12;	8.39%	
I do not agree	n=27;	37.50%	n=88;	61.53%	33.830**
I do not know	n=15;	20.83%	n=43;	30.00%	
Do you know the person who offered a drug to you the first time?					
Yes	n=71;	80.19%			
No	n=20;	19.80%			

* P<0.05; ** P<0.001.

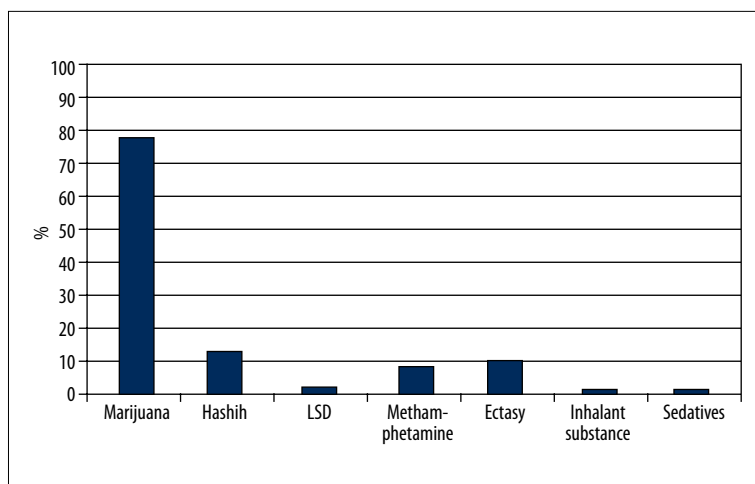


Figure 2. Percentage distribution of drug consumption according to type in E and C group.

the C group consider their drug awareness as adequate ($n=74$; 52.48%), the students in the E group consider that as an inadequate ($n=34$, 47.22%) and this was statistically significant ($\chi^2=16.897$; $P<0.001$). Both studied populations consider that the best „antidrug activity“ is conversation with a treated and “clean” addict. Most young women declare curiosity as a reason for trying illegal drugs ($n=59$; 67.81%). Agreement with legalization of marijuana was reported by 41.66% of drug students using illegal drugs and 8.39% of students who do use illegal drugs and this difference was statistically significant ($\chi^2=33.83$; $P<0.001$). Most students ($n=71$; 80.19%) reported that someone had offered them an illegal drug.

Discussion

Our study deals with use of illegal drugs by female university students, and discusses some selected aspects (e.g., family background, sport activities, and relationships with friends) to ascertain their views, attitudes and behavior in relation to illegal drug use. As subjects we chose female university students because after the graduation they will work at primary and secondary schools as teachers and they will shape the younger generation with their attitudes and beliefs in the future. Substance abuse is the number one public health problem for universities [3,6,22]. Adolescent substance abuse potentially holds a number of negative implications for the health and well-being of the individual, including increased risk for injury and death from interpersonal violence, motor vehicle injury, drowning [7], increased probability of engaging in high-risk sexual behaviors [8]; and increased risk for suicidal ideation and behaviors [9]. Some other studies indicated that there is a link between substance abuse and getting involved in crime, and a high prevalence of substance abuse among juvenile offenders [10]. Not having friends was positively associated with use of tobacco and illicit drugs and negatively associated with alcohol use [23].

In our group, 72 (33.48%) young women admitted taking illegal drugs and 143 (66.51%) had never tried illegal drugs. In some studies it has been shown that there is a strong association between adolescent age and substance abuse [11]. Logistic regression analysis indicated that the age of students had a relationship with lifetime alcohol use, but results showed that there is no significant association between age and lifetime drug abuse. Analysis of issues related to family background of respondents confirmed the relationship between drug use, place of residence, and education of parents. Students of both studied groups considered the communication with their parents was satisfactory and also positively evaluated their parents in providing assistance and support. Their parents are also interested how they are spending their leisure time and which activities they prefer. Also negatively associated with such risk behaviors were characteristics of the family context represented by: living with parents, having meals together, and parental supervision (when parents know what the child does in their free time) [24].

These factors of family background showed a statistically significant relationship between experimental and control group. Parental consumption of legal drugs (alcohol and cigarettes) did not show statistical significance. We did not confirm a statistically significant relationship between leisure time sport activity and drug use. It is interesting that the students of both groups did not strictly express an unfavorable opinion about abandonment of a friend who would take drugs. The most frequent place of contact with illegal drugs is during meeting with friends and at the disco. Few students considered accessing drugs in the school environment as difficult. Consumption of legal drugs (alcohol and cigarettes) in the studied population was at a satisfactory level, and statistical analysis did not confirm the association between experience with drug and alcohol consumption and smoking. The findings of this study, like those in other studies [12], showed that lifetime alcohol use and lifetime drug abuse relates to the smoking

status of friends. In spite of these findings, we cannot determine whether having smokers as close friends are a risk factor for substance abuse or if students who used illegal drugs choose smoker as their friends. On the other hand, the adolescents who become friends may have common characteristics that may have association with substance abuse. Some authors have argued that the use of alcohol and tobacco tends to precede and to increase the risk of initiating illegal drug use [13]. Similarly, other authors found that regular smokers are more likely to drink and are 10–30 times more likely to use illegal drugs than non-smokers [14]. The results of a study [15] conducted in 10th grade students showed that 16.9% of students were experimenters and 2.5% of students were regular smokers. Furthermore, the results of a recent study [16] showed that 32% of students had experienced alcohol consumption and 2.1% of them had lifetime drug abuse. During the past decade, the use of marijuana and other illicit drugs has increased considerably among college students, whereas alcohol use has held relatively steady during the same period [4,17,22]. First experiences with illegal drug use tended to be in high school, followed by elementary school and university. Marijuana is the most consumed illegal drug in our studied population of students, followed by hashish. Epidemiological research indicates young Americans 18–29 years old are the most likely to use marijuana or other illicit drugs relative to other age groups [4,18,25]. Most students, who are not using drugs, learned about illegal drugs from school, while the students who already have experience with drug use learned about drugs from their friends. Statistical significance of differences in this endpoint was confirmed. Most students (in both studied groups) considered they had adequate knowledge about drugs. It is a striking finding, because having negative information about drugs did not hamper them from taking drugs. Student may believe they have adequate knowledge about drugs, but deeper analysis of their knowledge proves that this knowledge is drawn from friends, media, and magazines, and is only superficial. Insufficient information from parents about negative effects of drugs on the human body can be considered as a negative phenomenon. While more than half of students not using drugs considered awareness of this issue in Slovakia to be sufficient, drug users consider it to be inadequate. This endpoint showed a statistically significant relationship. Both groups of young women considered that the most effective form of prevention by is discussion with the reformed male drug user. Curiosity is the most common cause that led to the first contact with any drug in our group of young women. We assume that the main reason is to fit in with a group of friends, but this was not confirmed in our study. Reasons for first contact with drugs are mixed. Slovak research conducted at the university [19] shows that

curiosity is on the leading reason, but that other reasons include friends, false heroism, personal problems, family problems, incidental contact with a drug dealer, problems at school, and boredom. Most drug users agree with legalizing marijuana in Slovakia, as opposed to young women, who have negative attitude towards drugs. We confirmed a statistically significant dependence on this endpoint. The most frequently mentioned person who offered drugs to students was a friend.

Conclusions

We have determined that education of parents has a statistically significant influence on drug abuse of their children. Communication between parents and children and parents paying attention to their children have significant roles in risky behavior (drug abuse). Parents of students not abusing drugs were interested in how their children spend their free time. We have not confirmed a statistically relevant correlation between spending of free time engaged in sports and drug abuse. In the area evaluating the attitudes towards friends, we have not detected any statistically relevant differences between the groups. We have confirmed the relationship between consumption of alcohol and drug abuse and smoking. The first contact with drugs occurs most frequently at the high school age. The most consumed, so-called soft drug, in our group of female university students is marijuana. We have recorded statistically significant dependence between drug abuse and source of information on drugs and also between drug abuse and attitude towards legalization of marijuana. A relative majority of young woman stated curiosity as a reason for use of drugs.

Our study has revealed some context, pointing to the need of more prevention at primary school. Because the issue of drug use by university students is still studied, our findings are important for comparison and generalization of causes of the steady increase in the number of young people using illegal drugs. These findings suggest that institutions of higher education may need to provide opportunities for screening to detect students at risk for drug abuse. More importantly, additional efforts are needed to ensure that adequate assessment, monitoring, and treatment options are available for those individuals at risk for drug abuse. Past college-based longitudinal studies have shown that many forms of drug use tend to increase during the transition from high school to college and then decline as students graduate and assume post-college responsibilities [4,20,21]. However, more prospective longitudinal studies are needed to determine whether these findings also apply to the course of drug use disorders among university students.

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