



The Importance of Family Relations for Cannabis Users: The Case of Serbian Adolescents

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Abstract

Background: Adolescence is transitional stage of physical and mental human development occurring between childhood and adult life. Social interactions and environmental factors together are important predictors of adolescent cannabis use. This study aimed to examine the relationship between the social determinants and adolescents behavior with cannabis consumption.

Methods: A cross sectional study as part of the European School Survey Project on Alcohol and other Drugs was conducted among 6.150 adolescents aged 16 years in three regions of Serbia, and three types of schools (gymnasium, vocational – professional, and vocational – handicraft) during May – June 2008. A multivariate logistic regression analysis was carried out to obtain adjusted odds ratios with 95% confidence intervals in which the dependent variable was cannabis consumption non-user and user.

Results: Among 6.7% of adolescents who had tried cannabis at least one in their lives, boys were more involved in cannabis use than girls, especially boys from gymnasium school. Well off family, lower education of mother, worse relations with parents were significantly associated with cannabis use ($P < 0.05$). Behaviors like skipping from schools, frequent evening outs, and playing on slot machines were also related to cannabis use ($P < 0.05$).

Conclusions: The study confirmed the importance of family relationship development. Drug use preventive programmes should include building interpersonal trust in a family lifecycle and school culture.

Keywords: Social determinants, Behavior, Adolescents, Cannabis use, ESPAD survey

Introduction

Cannabis use has been recognized to have negative effects on adolescents' health, including psychological and physical problems. Immediate health problems are psychotic symptoms, depression, suicidal behavior, respiratory disease, difficulties in functions related to learning, concentration and memory, decrease in school performance. Behavior problems following the previous are: interpersonal bullying, traffic accidents and drowning and risky sexual behaviors (1, 2). At older age, these people may adopt other risk be-

haviors, such as other illegal drug use, violence, and delinquency (3).

Cannabis still holds the position of the most widely-used and available illicit drug in Europe (4). The prevalence of experimental cannabis consumption (at least once) among European 15 – years old was from under 10% to over 30% (5). In most European countries, cannabis use increased during the 1990s and early 2000s. Growing popularity of cannabis use has been particularly observed in countries of central and Eastern Europe (6). Ser-

bia is on the traditional Balkan drug trafficking Route, well-known as the "drug road", which is used by organized criminal groups to transfer a variety of illegal drugs into and from Europe to supply increasing poly-drug consumption of some two million citizens with drug problems. The route expansion is a driving factor of Europe's black economy as well as of organized crime development (7). The biggest cities in Serbia are on this road: Novi Sad (the capital city of the Serbian autonomous province of Vojvodina), Belgrade (the capital city of Republic Serbia), Kragujevac (the city in the central Serbia) and Nis (the city in southern Serbia).

Serbian transition milieu in the post-war period is very convenient for international crime operations from Asia via Balkan Peninsula to Western Europe. In some parts of Serbia, along the rivers Sava, Dunav, and Morava, cannabis is grown and it can be bought at our markets (8). Studies related to drug abuse among adolescents are actual. During the nineties, illegal drug market was similar in all parts of Serbian, so the cannabis was the most used drug among children of 13 to 15 years of age and that (9). Considering various researches cannabis consumption by the adolescent could be serious public health problem (10).

The study Health Behavior of School Children completed in 1999 with a sample of 5.500 children in Belgrade of 11, 13, and 15 age (11) has shown that cannabis was the most commonly used drug among the adolescents. During social disturbance in Serbia prior 2000, two studies has pointed out that 2.9% adolescents had experience with this drug and cannabis tried 5-7% at ages 15 years among schoolchildren. Cannabis users were more boys than girls (8, 12). In 2005, a pilot study based on the European School Survey Project on Alcohol and other Drugs (ESPAD) methodology indicated age 15 -16 years as critical for more often try of cannabis, 12.9% adolescent from the cities of Belgrade, Nis and Novi Sad, at age 16 reported lifetime experience with cannabis (13).

Adolescence is transitional stage of physical and mental human development from childhood to adult life. Its characteristics are rapid physical growth, and psychological, mental and social ma-

turity (14). Adolescents' behavior is shaped by different factors such as: personal factors, factors of the personal social context, environmental and socio-cultural factors, and the interaction of all these factors (15). Even, experimentation with drugs during this period can be considered as a statistically normative phenomenon (16). According to factors of the personal social context, substance-using peer groups and others such as older siblings have been found the strongest predictor of cannabis use in adolescence (17).

Environmental factors such as easy availability of cannabis also tend to increase possibility of adolescent substance use (18). Besides, the other environmental factors could have critical role in personal development and social context: culture, race, socioeconomic and demographic factors (living in a single – parent family, poor interaction and communication with parents), education (poor academic performance or leaving school), social guidance (alcohol availability, social drinking norms and history of tobacco smoking) and health condition (mental conditions, antisocial behaviors) (1, 2, 19). Social interactions and environmental factors together are important predictors of adolescent cannabis use (10). They create an ambience in which adolescents are exposed to cannabis use or have the opportunity to abuse it. That could be measured by frequency of evenings out with friends.

For different target groups in Serbia, there are drug preventive activities, the government also adopted a National Strategy for the Fight against Drugs from 2009 to 2013 (20).

The aim of this study was to examine the relationship between the social and demographic determinants and adolescents behavior with cannabis consumption.

Materials and Methods

Design and selection of the sample

The study was a part of the European School Survey Project on Alcohol and other Drugs (ESPAD) among adolescents conducted during May – June 2008 (13). A cross sectional study was carried out among a stratified one - stage sample of 6155

schoolchildren out of 7911, aged 16 years, born in 1992. There were 2,856 (46.4%) boys and 3299 (53.6%) girls. The schoolchildren were attending their first year of secondary school in Serbia. The study included 273 secondary schools out of 290. The sampling frame, the list of all secondary schools in Serbia was provided by the Ministry of Education. The number of classes and number of students in classes was estimated based on the number of schools and classes in the previous period. The sample was selected to provide statistical reliability at two levels: the territorial coverage and type of secondary schools. The territorial coverage comprised three regions of Serbia: the autonomous province of Vojvodina represented by capital city Novi Sad, territory of Belgrade represented by capital city of Serbia, Belgrade and Central Serbia represented by the biggest city in South Serbia, Nis. In Vojvodina there were 1491 (24.2%) schoolchildren, in Belgrade 1160 (18.8%) and in Central Serbia 3504 (56.9%). Also, territorial coverage included the big and small cities, and rural areas. There were 3285 (53.4%) adolescents in big cities, 2695 (43.8%) in small cities and 175 (2.8%) in rural areas. Type of schools were selected by school branches that existed in urban and rural areas: gymnasium (four years of general education), vocational – professional (four years of professional education) and vocational – handcraft (three years of specific education for different types of crafts). Numbers of schoolchildren were: 1524 (24.8%) in gymnasium, 3682 (59.8%) in vocational – professional school and 949 (15.4%) in vocational – handcraft school.

Procedure

The survey data were obtained through a self-reported questionnaire with previous consent obtained from the Parent Council in selected schools and the Ethical committee of the Institute of Public Health of Serbia. The ESPAD 2003 questionnaire was translated and adapted into Serbian language. It included 74 questions, 30 items related to the socio-demographic characteristics (school, spare time, social contexts, problems, self perception and crime/violence), and 44 items addressed

to psychoactive substance use (2 questions about tobacco, 12 questions about alcoholic beverages, 12 questions about cannabis and various illicit drug usages and 18 questions about attitudes and ideas with regard to psycho active substance – PAS use). The questionnaire was administrated in classrooms under conditions similar to written test in presence of the research assistants, while teachers were absent. The survey took about 45 minutes, one school class (in our study 41 minutes in average). Participation was voluntary and there were no consequences for those who did not wish to participate. On the day of research, 7 schoolchildren (5 boys and 2 girls) refused to take part. Children were free to leave some questions unanswered. In order to preserve complete anonymity of the respondent, each filled questionnaire, children placed in a sealed envelope. After analyzing the data quality the sample involved 6155 schoolchildren.

Variables

Total of 18 variables were analyzed as indicators of cannabis consumption. Those were: sex; family background (father's and mother's education, and well off families); relations (parents familiarity on Saturday night, and relationship to father, mother and friends); adolescent behavior towards school duties (school grades and missed classes during the last 30 days due to skipping), and adolescent activity during leisure time (playing computer games; active practicing of sports, athletics, and exercises; reading books for pleasure excluding school literature; evening outs to discotheque, bars, parties, and etc.; hobbies as playing instruments, singing, drawing, and writing; going with friends to the shopping malls, walking in the streets or parks for pleasure; using the internet; and playing on slot machines). Most of the answers were presented at the six and seven point scale (see Table 1). According to cannabis consumption, adolescents were divided as *non-users* (having never tried it) and *users* (having consumed it at least once in their life). All variables related on social determinants were transformed into two categories, where the code "1" was presented better values, and code "0" the worse

Table 1: Cannabis consumption and general characteristics of 16 years old adolescents

Variables		Total	Categories (number and percentage)								
			1	2	3	4	5	6	7		
Adolescent	Sex ^a	N	6155	2856	46.4	3299					
		%	100		53.6						
	Cannabis lifetime ^b	N	6133	5724	93.0	189	85	42	38	26	29
		%	99.6		3.1	1.4	0.7	0.6	0.4	0.5	
Family background	Father education ^c	N	6055	245		261	3000	646	1748	155	
		%	98.4	4.0		4.2	48.7	10.5	28.4	2.5	
	Mother education ^d	N	6113	343		307	3064	592	1678	129	
		%	99.3	5.6		5.0	49.8	9.6	27.3	2.1	
Relations	Family well off ^e	N	6061	134		203	1169	3041	1113	289	112
		%	98.5	2.2		3.3	19.0	49.4	18.1	4.7	1.8
	Parents familiarity on Saturday night ^f	N	6121	3865		1407	606	243			
		%	99.4	62.8		22.9	9.8	3.9			
	With father ^g	N	6071	3439		1478	468	279	177	230	
		%	98.6	55.9		24.0	7.6	4.5	2.9	3.7	
	With mother ^h	N	6115	3969		1399	403	208	72	64	
		%	99.4	64.5		22.7	6.5	3.4	1.2	1.0	
	With friends ⁱ	N	6115	3751		1925	279	118	28	14	
		%	99.4	60.9		31.3	4.5	1.9	0.5	0.2	
Adolescent behavior towards school duties	School grades ^j	N	6018	922	15.0	1008	1214	2331	94	99	
		%	97.8		16.4	19.7	37.9	1.5	1.6		
	Skipped school ^k	N	5699	3617		1178	385	271	91	157	
		%	92.6	58.8		19.1	6.3	4.4	1.5	2.6	
Adolescent activity during leisure time	Computer games ^l	N	6111	402	6.5	517	1316	1823	2053		
		%	99.3		8.4	21.4	29.6	33.4			
	Sports ^m	N	6090	424	6.9	507	760	1825	2574		
		%	98.9		8.2	12.3	29.7	41.8			
	Read books ⁿ	N	6090	1608		2202	1287	492	476		
		%	98.9	26.1		35.8	20.9	8.0	7.7		
	Evening outs ^o	N	6065	372	6.0	434	1234	3169	886		
		%	99.0		7.1	20.0	51.5	14.4			
	Hobbies ^p	N	6009	2326		665	758	839	1421		
		%	97.6	37.8		10.8	12.3	13.6	23.1		
	Shopping mall ^q	N	6087	240	3.9	278	847	2150	2572		
		%	98.9		4.5	13.8	34.9	41.8			
	Internet ^r	N	6081	1387		370	940	1413	1971		
		%	98.8	22.5		6.0	15.3	23.0	32.0		
	Slot machines ^s	N	6112	5150		343	249	175	195		
		%	99.3	83.7		5.6	4.0	2.8	3.2		

^a - 1 (boys), 2 (girls) / ^b - 1 (never used), 2 (1-2 times), 3 (3-5 times), 4 (6-9 times), 5 (10-19 times), 6 (20-39 times), 7 ("40+ times) / ^{c, d} - 1 (completed primary school or less), 2 (some secondary school), 3 (completed secondary school), 4 (some college or university), 5 (completed college or university), 6 (do not know) / ^e - 1 (very much better off), 2 (much better off), 3 (better off), 4 (about the same), 5 (less well off), 6 (much less well off), 7 (very much less well off) / ^f - 1 (know always), 2 (know quite often), 3 (know sometimes), 4 (usually do not know) / ^{g, h, i} - 1 (very satisfied), 2 (satisfied), 3 (both yes and no), 4 (not very satisfied), 5 (not at all satisfied), 6 (I do not have such person) / ^j - 1 (excellent, I am probably one of the very best), 2 (well above average), 3 (above average), 4 (average), 5 (below average), 6 (well below average) / ^k - 1 (none), 2 (1 day), 3 (2 days), 4 (3-4 days), 5 (5-6 days), 6 (7 days and more) / ^{l, m, n, o, p, q, r, s} - 1 (never), 2 (several times a year), 3 (1 or 2 times a month), 4 (at least 1 time a week), 5 (almost every day)

Statistical analysis

The categorical variables are expressed as frequencies / percentages. Univariate analyses were carried out to study differences in socio-demographic characteristics and behavior associated with cannabis use by regions of Serbia and types of schools. A multivariate logistic regression analysis was carried out to obtain adjusted odds ratios (OR) with 95% confidence intervals (CI) in which the dependent variable was cannabis consumption non-user and user (having never tried it and having consumed it at least once). The independent variables were those which were statistically associated with cannabis use ($P < 0.05$). The IBM SPSS Statistics 19 package was used for these analyses.

Results

Characteristics of the sample

Table 1 illustrates the relevant sociodemographic and cannabis consumption characteristics in the study sample. In the sample of 6155 adolescents age 16, only 6.7% of them have tried cannabis at least ones in their lives. Half of adolescents graded their family's economical situation, compared to the other families, as average. Almost half of parents had second school education. In average, about 86% of adolescents reported that their par-

ents always and almost always know where their children had spent Saturday night. Adolescents were, in great percentage, satisfied with their relationships with parents, a little more with mother than with father. Also, two-thirds of adolescents were very satisfied with their relationship with friends. More than one-third of adolescents estimated their school performance as average. Almost two-thirds of adolescents have never missed classes during the last 30 days. The other had skipping classes more than one day due to reasons different than illness or some other reasons (for example tests). The most frequently performed everyday activities were: going with friends to a shopping mall, walking in the streets or in the parks (41.8%). Same percentage of adolescents spent their spare time actively practicing sports, athletics or exercises. More than one - third of adolescents were spending time on the computer or playing computer games.

Sociodemographic factors associated with cannabis consumption

As shown in Table 2 and Table 3, after applying the univariate analysis, 11 variables out of 18 described adolescents and their habits were associated with cannabis consumption by regions, and by type of school in at least one sociodemographic dimension and spare time.

Table 2: Unadjusted odds ratios OR for sociodemographic characteristics and adolescent behavior associated with cannabis use by regions: univariate analyses

Factors	Regions of Serbia					
	Vojvodina		Belgrade		Central Serbia	
	OR	(95% CI)	OR	(95% CI)	OR	(95% CI)
Sex	2.055	1.413-2.991*	1.383	0.924-2.070	2.030	1.484-2.776*
Boys/ Girls						
Father education	1.250	0.674-2.320	1.889	0.676-5.276	1.158	0.702-1.908
Yes/ No						
Mother education	1.612	0.873-2.978	2.604	0.807-8.406	1.540	0.924-2.564
Yes/ No						
Familly well off	1.106	0.733-1.669	1.618	1.054-2.485*	1.481	1.065-2.061*
Yes/ No						
Saturday night	0.427	0.280-0.652*	0.281	0.178-0.445*	0.315	0.225-0.441*
Yes/ No						
Relationship father	0.682	0.448-1.037*	0.462	0.296-0.720*	0.313	0.227-0.431*
Yes/ No						

Table 2: Cond...

Relationship mother Yes/ No	0.557	0.347-0.895*	0.476	0.289-0.785*	0.472	0.323-0.690*
Relationship friends Yes/ No	1.023	0.504-2.078	1.189	0.467-3.030	1.239	0.664-2.313
School grades Yes/ No	0.456	0.269-0.774*	0.487	0.278-0.856*	0.549	0.350-0.861*
Skipped school Yes/ No	2.065	1.310-3.257*	2.891	1.875-4.457*	3.917	2.812-5.456*
Computer games Yes/ No	1.157	0.696-1.922	1.167	0.669-2.034	1.231	0.765-1.982
Sports Yes/ No	0.946	0.580-1.545	0.479	0.295-0.777*	0.709	0.483-1.040
Read books Yes/ No	0.699	0.463-1.056	0.931	0.615-1.408	0.969	0.705-1.332
Evening outs Yes/ No	6.046	1.902-19.215*	3.013	1.377-6.593*	2.702	1.370-5.327*
Hobbies Yes/ No	1.268	0.883-1.822	1.002	0.669-1.502	1.309	0.962-1.781
Shopping mall Yes/ No	1.142	0.564-2.314	0.984	0.480-2.015	1.422	0.763-2.651
Internet Yes/ No	1.586	0.986-2.551*	1.112	0.685-1.804	1.322	0.938-1.863
Slot machines Yes/ No	3.829	2.528-5.799*	3.212	1.922-5.368*	4.333	3.051-6.153*

* $P < 0.05$

Multiple logistic regression analyses (Table 4) indicated that the sex was associated with cannabis consumption in Vojvodina and the Central Serbia, i.e. boys consumed cannabis more than girls. Family's financial situation was associated with cannabis consumption in Central Serbia, the adolescents from well of families more used cannabis. In Belgrade and the Central Serbia the adolescents who were satisfied with the relationship with their father less consume cannabis. In Vojvodina the adolescents who were satisfied with the relationship with their mother less consume cannabis. Adolescents whose parents knew where they spent Saturday night consume less cannabis in Belgrade and Central Serbia. Adolescents who skipped classes consumed more cannabis in Belgrade and Central Serbia. In all three regions, spare time activities like evening outs and playing on slot machines were associated with cannabis consumption. Only in Vojvodina, using the internet in spare time was associated with cannabis consumption. Multiple logistic regression analyses (Table 5) indicated that the sex was associated with canna-

bis consumption in gymnasium, and vocational – professional secondary schools. Gymnasium boys were almost two times more consuming cannabis than the girls, while it was less in professional secondary schools. In professional school, adolescents with better family's financial situation were more using cannabis. Adolescents whose parents knew where they spent Saturday night consumed less cannabis in gymnasium and vocational – professional school. Adolescents who had better relationship with father abused less cannabis in professional and handcraft school. While, adolescents who had better relationship with mother abused less cannabis in gymnasium. Higher education of mother was associated with lower cannabis consumption of adolescents in vocational – professional schools. Missed classes due to skipping classes was associated with cannabis use in all three types of school, and it was more among adolescents in vocational – handcraft school. In all three schools, more spare time spent on activities like playing on slot machines was associated with more frequent cannabis consumption, and almost

three times more among adolescents in gymnasium and vocational – handcraft school. However, more evening outs were associated with cannabis

consumption among adolescents in vocational – professional schools.

Table 3: Unadjusted odds ratios OR for sociodemographic factors and adolescent behavior associated with cannabis use by types of schools: univariate analyses

Factors	Gymnasia		Type of school Professional		Handcraft	
	OR	(95% CI)	OR	(95% CI)	OR	(95% CI)
Sex	1.920	1.283-2.872*	1.819	1.390-2.381*	2.047	1.184-3.537*
Boys/ Girls						
Father education	0.762	0.342-1.701	1.504	0.950-2.379	1.402	0.588-3.343
Yes/No						
Mother education	1.709	0.615-4.747	1.647	1.070-2.535*	2.361	0.839-6.646
Yes/No						
Familly well off	1.215	0.787-1.876	1.448	1.092-1.921*	1.564	0.868-2.818
Yes/No						
Saturday nigh	0.261	0.166-0.412*	0.351	0.264-0.467*	0.476	0.243-0.932*
Yes/No						
Relationship father	0,490	0,316-0,760*	0,481	0,361-0,640*	0,193	0,108-0,345*
Yes/No						
Relationship mother	0.439	0.272-0.708*	0.545	0.388-0.767 *	0.412	0.217-0.783*
Yes/No						
Relationship friends	1.018	0.460-2.252	1.287	0.752-2.202	1.102	0.333-3.647
Yes/No						
School grades	0.461	0.257-0.826*	0.576	0.395-0.841*	0.344	0.165-0.717*
Yes/No						
Skipped school	2.917	1.817-4.682*	2.882	2.167-3.834*	4.349	2.414-7.834*
Yes/No						
Computer games	1.004	0.593-1.699	1.226	0.827-1.816	1.144	0.506-2.586
Yes/No						
Sports	0.595	0.352-1.004	0.739	0.535-1.022	0.721	0.371-1.400
Yes/No						
Read books	0.746	0.492-1.130	0.844	0.638-1.117	1.241	0.714-2.158
Yes/No						
Evening outs	3.668	1.334-10.088*	3.210	1.783-5.780*	2.847	0.876-9.257*
Yes/No						
Hobbies	1.145	0.762-1.720	1.247	0.964-1.614	1.350	0.778-2.345
Yes/No						
Shopping mall	2.034	0.734-5.634	1.179	0.736-1.890	0.752	0.290-1.955
Yes/No						
Internet	1.658	0.930-2.956	1.188	0.894-1.579	3.324	1.486-7.439*
Yes/No						
Slot machines	4.992	3.108-8.018*	3.445	2.550-4.654*	4.489	2.359-8.544*
Yes/No						

* $P < 0.05$

Table 4: Factors significantly associated with marijuana/cannabis use by regions: multiple logistic regression analysis

Factors	Regions of Serbia					
	Vojvodina		Belgrade		Central Serbia	
	OR	(95% CI)	OR	(95% CI)	OR	(95% CI)
Sex	1.593	1.004-2.525 *			1.831	1.240-2.704*
Boys/Girls						
Family well off					1.482	1.012-2.169*
Yes/ No						
Saturday night			0.396	0.232-0.676*	0.474	0.320-0.702*
Yes/ No						
Relationship father			0.536	0.311-0.923*	0.317	0.211-0.477*
Yes/ No						
Relationship mother	0.556	0.311-0.995*				
Yes/ No						
Skipped school			1.930	1.165-3.199*	2.477	1.684-3.642*
Yes/ No						
Evening outs	4.130	1.273-13.403*	2.640	1.030-6.765*	2.467	1.067-5.705*
Yes/ No						
Internet	1.799	1.021-3.170*				
Yes/ No						
Slot machines	2.306	1.351-3.936*	2.381	1.300-4.360*	2.819	1.828-4.348*
Yes/ No						

* $P < 0.05$

Table 5: Factors significantly associated with cannabis use by schools: multiple logistic regression analysis

Factors	Type of school					
	Gymnasia		Professional		Handcraft	
	OR	(95% CI)	OR	(95% CI)	OR	(95% CI)
Sex	1.700	1,021-2,829*	1.428	1.033-1.975*		
Boys/ Girls						
Family well off			1.387	1.006-1.913*		
Yes/ No						
Saturday night	0.362	0.214-0.613*	0.540	0.387-0.753*		
Yes/ No						
Relationship father			0.495	0.348-0.704*	0.196	0.096-0.403*
Yes/ No						
Relationship mother	0.429	0.233-0.789*				
Yes/ No						
Mother education			1.762	1.062-2.923*		
Yes/ No						
Skipped school	1.755	1.021-3.018*	2.033	1.467-2.817*	2.712	1.287-5.714*
Yes/ No						
Evening outs			2.574	1.337-4.954*		
Yes/ No						
Slot machines	2.949	1.613-5.39*	2.301	1.592-3.326*	3.069	1.286-7.324*
Yes/ No						

* $P < 0.05$

Discussion

Our findings in this nationally representative sample of adolescents have shown that, 6.7% of Serbian adolescents tried cannabis at least ones in their lives. According to social determinants of cannabis abuse, adolescents from Central Serbia were more similar to adolescents from Belgrade, and greater similarity has been noted between the adolescents from gymnasium and vocational – professional school. Then years ago, 5% of 5.137 adolescents' age 11-15 years in 27 Serbian cities has experienced cannabis (12). Few years before our study, there were 12.9% adolescents at age 16 from biggest cities of Serbia in Belgrade, Nis and Novi Sad who have reported lifetime experience with cannabis (13). Other researchers pointed that cannabis use among adolescents in 20 countries between 1995 and 2003, increased from 12% to 20% on average, while in 2007 slightly decreased (21). Our study has showed that boys in Vojvodina and Central Serbia consumed cannabis more than girls. Similar data were found in 31 European and North American countries (10, 17). However, when boys and girls were in the same situation, their behavior was the same in consumption of cannabis (1, 2, 22, 23).

In our study, boys who attended gymnasium and professional schools, where genders were proportional opposite to vocational – handcraft schools, consumed cannabis more frequently than girls. It might be the bias, if in those types of school there were more boys than girls.

There is evidence that low socio-economic status may lead to increased drug use (24). Researches emphasized the necessity to examine whether adolescents from wealthier family are exposed to greater drug abuse (25). In our study adolescents from wealthier families were more associated with cannabis consumption in Central Serbia and in professional schools. The drug market is available to everyone, but wealthier could buy easier.

The period 2003-2008 has recorded a decrease or stable retail price of cannabis in most European countries (6, 26). Serbia is among the countries with low cannabis price, lower than in surrounding countries (2.2\$ per gram with range 1.5–4.4

\$ in 2008) (27). The danger for adolescents is increasing production of modified cannabis (skunk) in laboratories and its' extremely acceptable price (26, 28).

In Serbia, it has been recognized that adopting the strategic documents for healthy behavior promotion among youth is needed (e.g. Strategy of Development of Young People's Health, 2006; National Strategy Against Drugs and Alcohol 2009-2013) (29). Numerous preventive activities and campaigns to reduce drug abuse are implemented in community, kindergartens and schools by different institutions, bodies, police, etc. Besides, question regarding the parents' awareness where their children spend Saturday night is the control criteria which parents have. Our study showed that it is important that parents have a control above adolescents in gymnasias and professional schools evening outs, spare time activities, and skipping the school. It is known, that school and family environments including community may increase the influence of adolescents risk behavior and drug use, although this matter has not been thoroughly analyzed (30).

Relationships with parents, satisfaction with mother or father were predictors of cannabis use among adolescents in Serbia. The literature indicates that structure of family and difficulties in communicating with parents were predictive factors for cannabis abuse (1, 2, 31). Good communication and quality of relationship between parents and children are leading to parent' awareness where their children spend time and which activities carry out with friends. The traditional gender roles in 77% Serbian's families, unlike European, are mother taking care of home and household, while father secure family and finances, and at the same time the relationship with mother is better than with father (32, 33, 34). Our research showed that better satisfaction with mother and her higher education was more protective against cannabis use.

Absences from classes due to skips were associated with cannabis use in Belgrade and Central Serbia, and among adolescents in all three types of schools. It is important to offer positive school climate, and school and family together may sup-

port the development and implementation of effective prevention and intervention approaches (35, 36- 38).

Spare time activities offer the opportunities for adolescents to experiment with new roles and participate in risky behavior (10). Our results are consistent with evidence of the previous studies in United States and European countries considering correlation between cannabis use and evening outs (10, 17, 39). In Serbia, when the study was conducted, casinos and places with slot machines were located everywhere and even near the schools, which were potential risk for higher accessibility to cannabis. At the beginning of 2010, the action has been initiated to close places where gambling slot machines were available. Also, there has been recommended to prohibit the gambling places that were less than 200 meters from the schools, and prohibit the entry to the persons under age of 18. In Serbia, there is trend for opening internet coffee – spots where adolescents can spend spare time. The internet, as closer form of communication, gives them easier access to information about cannabis consumption and prices. Online retailers of drugs products are growing in UK, the Netherlands, Germany and Austria, and they adapt rapidly to new attempts to control the market (40). In 2008, 33.2% of Serbian households had internet, and internet connection was greatest in Belgrade, followed by Vojvodina and Central Serbia (41).

The main strength of our study is possibility to follow-up data in the future and large sample of the study and coverage on the national level. Application of standardized methodology - ESPAD enables comparisons between European countries. However, data are not representative for all adolescents in Serbia born in 1992, but only for adolescents who attended the first grade of secondary school and were the same age. The reasons are: the secondary school is not obligatory, and some young people after the primary school did not continue further education or some adolescents went to the secondary school later. Other limitations are self-report biases. Even though study reflects adolescents' perception, some evidences

suggest that report of current substance use is generally reliable.

Conclusion

In Serbia socio economic factors such as well off families and lower education of mother are significantly associated with adolescent cannabis use. The study confirmed the importance of family relationship development for decreasing adolescent cannabis use, and risky activities during leisure time (particularly playing on slot machine) and skipping from schools. Better relations and trust building between adolescents and parents should be the focus of preventive programmes. The results of this study are important for policy makers to create partnerships in community, which can contribute to effective drug prevention programs. Our findings also may be important for advanced investigations, because it is known that cannabis use could be associated with acceptance of other risk behaviors at a later stage.

Ethical considerations

Ethical issues (Including plagiarism, Informed Consent, misconduct, data fabrication and/or falsification, double publication and/or submission, redundancy, etc) have been completely observed by the authors.

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