University of Novi Sad, Faculty of Medicine Novi Sad[1]
Institute of Public Health of Vojvodina, Novi Sad[2]

Professional article
Stručni članak
UDK 613.83:663.992]-053.6(497.113
https://doi.org/10.2298/MPNS2206182J

PEER INFLUENCE ON MARIJUANA USE AMONG ADOLESCENTS IN NOVI SAD

UTICAJ VRŠNJAKA NA UPOTREBU MARIHUANE KOD ADOLESCENATA U NOVOM SADU

Bojana JOVANČEVIĆ[1], Ivana RADIĆ[1, 2] and Snežana UKROPINA[1, 2]

Summary

Introduction. Cannabis use in adolescence has a major impact on the individual, family and community, whereas the effects are cumulative and contribute to social, physical and mental problems. Socializing with peers who use psychoactive substances can significantly increase the likelihood of adolescent cannabis use. The aim of this study was to determine the prevalence of cannabis use among adolescents in Novi Sad, as well as the differences in prevalence depending on the risky behavior of their friends depending on the relationships between them. **Material and Methods.** The research was conducted as a cross-sectional study in 2017 and included 1,067 first-grade students from 19 high schools in Novi Sad. The research instrument was a questionnaire of the European School Survey Project on Alcohol and Other Drugs. **Results.** The prevalence of marijuana abuse in Novi Sad was 12% and it was twice higher among students from the city (13.1%) or suburban areas (13.6%) than in students from villages (5.8%) ($p < 0.05$). Marijuana use was significantly more prevalent among students whose most/all friends smoked (23.1%) than among those whose friends did not smoke (10.1%) or only a few smoked (5.5%) ($p < 0.001$). Respondents whose friends use alcohol were significantly more likely to use marijuana (15.2%) than those who have only a few such friends (6.4%) or none (10.5%) ($p < 0.001$). More than half of students whose friends use marijuana have tried it (54%), while among those who do not have such friends, only 3% have used marijuana ($p < 0.001$). **Conclusion.** The prevalence of marijuana use in adolescents in Novi Sad is high. Peer risk behaviors influence adolescent cannabis use.

Key words: Marijuana Use; Peer Group; Adolescent; Risk Factors; Health Risk Behaviors; Students

Sažetak

Uvod. Upotreba marihuane u periodu adolescencije ima veliki uticaj na pojedinca, porodicu i zajednicu, a efekti su kumulativni i doprinose socijalnim, fizičkim i mentalnim problemima. Druženje sa vršnjacima koji koriste psihoaktivne supstancije može značajno da poveća verovatnoću upotrebe marihuane kod adolescenata. Cilj rada bio je utvrđivanje prevalencije upotrebe marihuane kod adolescenata u Novom Sadu, kao i razlika u prevalencijama u zavisnosti od rizičnih ponašanja njihovih prijatelja i u zavisnosti od odnosa sa prijateljima. **Materijal i metode.** Istraživanje je sprovedeno kao studija preseka 2017. godine i obuhvatilo je 1.067 učenika prvih razreda iz 19 srednjih škola u Novom Sadu. Instrument istraživanja je bio upitnik Evropske školske ankete o zloupotrebi alkohola i drugih droga. **Rezultati.** Prevalencija zloupotrebe marihuane u Novom Sadu bila je 12% i dvostruko je veća kod učenika iz grada (13,1%) ili prigradskog naselja (13,6%) u odnosu na ispitanike sa sela (5,8%) ($p < 0,05$). Upotreba marihuane je bila značajno zastupljenija među učenicima čiji prijatelji, većina/svi, puše (23,1%) nego kod onih čiji prijatelji ne puše (10,1%) ili samo nekoliko njih (5,5%) ($p < 0,001$). Ispitanici čiji prijatelji koriste alkohol su značajno češće koristili marihuanu (15,2%) od onih ispitanika koji imaju samo nekoliko takvih prijatelja (6,4%) ili ih nemaju (10,5%) ($p < 0,001$). Više od polovine učenika, čiji svi ili većina prijatelja koriste marihuanu, probalo je marihuanu, (54%), dok među onima koji nemaju takve prijatelje samo 3% koristilo je marihuanu ($p < 0,001$). **Zaključak.** Prevalencija upotrebe marihuane kod adolescenata u Novom Sadu je visoka. Rizična ponašanja vršnjaka utiču na upotrebu marihuane kod adolescenata.

Ključne reči: zloupotreba marihuane; vršnjačke grupe; adolescenti; faktori rizika; ponašanje rizično po zdravlje; studenti

Introduction

Adolescence is the period from 10 to 19 years and it is the transitional stage from childhood to adulthood [1]. It is the phase of life when foundations and patterns of healthy behavior of the future adult person are established [2]. Many risky behaviors begin precisely during this period and are major challenges for public health [3]. Abuse of psychoactive substances among adolescents is a significant public health problem in many countries [4, 5]. The most commonly used illegal drug around the world is marijuana, i.e. cannabis [6, 7]. According to the data of the European School Survey Project on Alcohol and Other Drugs (ESPAD) conducted in 35 European countries, every third sixteen-year-old used marijuana at least once in their lives (16%) [6]. According to the data of the European Monitoring Center for Drugs and Drug Addiction, cannabis, as the most commonly abused illegal drug among young people in Europe, was used by 9.8 million young people between the ages of 8 and 24 in 2017 [15]. According to data from the ESPAD project in Serbia conducted in 2011, 4% of girls and 9% of young men have tried marijuana at least once in their lives. The fact that 24% of adolescent girls and 27%

Corresponding Author: Dr Bojana Jovančević, Univerzitet u Novom Sadu, Medicinski fakultet Novi Sad, 21000 Novi Sad, Hajduk Veljkova 3, E-mail: jovancevicbojana.mfns@gmail.com, snezana.ukropina@mf.uns.ac.rs

Abbreviations
ESPAD – European School Survey Project on Alcohol and Other Drugs

of adolescent boys believe that marijuana is easily accessible to them is worrying [7]. In Novi Sad, every tenth young man (10.0%) and every sixteenth girl (6.4%) (sixteen-year-olds) have tried marijuana at least once in their lives. About 1% of high school first graders have used marijuana more than 40 times in their lifetime [9]. Research shows that alcohol and marijuana abuse often occur together. The reasons for this are the cumulative or complementary effects of these two substances, their availability, price and social desirability [10, 11].

Factors that affect the health of adolescents act at different levels: individual (gender, age, knowledge and skills), family, community, cultural standards, and mass media [12]. Adolescent behavior is influenced by many different factors and according to the social learning theory adolescents learn behaviors by observing and imitating the behavior of family members, leaders and others [13]. In addition to the family, the most common sources of social influence are peers and that was confirmed by several studies [14–16]. Ferguson et al. reported that the peer influence on the use of psychoactive substances is greater than the influence of the family, the environment and the media [15], which is also confirmed by other authors [9, 17]. Especially important is the influence of peers who use different psychoactive substances (such as alcohol and marijuana). Socializing with such peers significantly increases the likelihood of using marijuana [14, 15]. It is assumed that peers who use psychoactive substances share information, attitudes, values, and norms regarding drug abuse and thus create a social context for substance abuse [18]. However, it is not entirely clear whether peer behaviors increase an adolescent's risk of engaging in problem behaviors (socialization effect) or whether a predisposition to problematic behavior simply increases the risk of associating with problematic peer groups (selection effect) [14]. Adolescents are more likely to engage in a risky behavior in a group than alone. Some adolescents, due to a limited degree of self-confidence, are not able to act independently of the influence of peers, and in order to raise their social status, they use marijuana [3, 19]. Adolescents are more likely to try marijuana if they are offered by close friends they trust [19]. The peer influence is particularly significant because in the adolescent period children spend more and more time with their peers and less time with their parents [20].

The aim of this paper was to determine the prevalence of marijuana use among adolescents in Novi Sad, to assess the differences in the prevalence of marijuana use by adolescents in Novi Sad associated with risky behavior of their friends, and to assess the differences in the prevalence of marijuana use among adolescents in Novi Sad associated with risky behavior of their friends and their relationships.

Material and Methods

The research is part of the project of the Institute of Public Health of Vojvodina and the City Administration for Health of the City of Novi Sad. The research was conducted as a cross-sectional study in the period from December 1 to December 26, 2017 using the methodology of the ESPAD. The target population included high school first-grade students from 19 high schools in the territory of the municipality of Novi Sad: Jovan Jovanović Zmaj Grammar School, Svetozar Marković Grammar School, Laza Kostić Grammar School, Isidora Sekulić Grammar School, Medical High School "April 7", Bogdan Šuput High School of Design, Mihajlo Pupin School of Electrical Engineering, Pinki Traffic High School, High School of Mechanical Engineering, Mileva Marić Einstein Technical School, Pavle Savić Technical School, High School of Agriculture, Isidor Bajić High School of Music, High Ballet School, Karlovci Grammar School, E-Grammar School, Sveti Arhangel Medical High School, and Clerical High School of Saint Arsenije Sremac.

The research included students who were in class on the day of the survey, while students who were not in class and those who dropped out of school, were not included in the study. The research instrument was the questionnaire of the ESPAD. The survey was conducted by trained interviewers from the Institute of Public Health of Vojvodina and students of the Faculty of Medicine in Novi Sad. Students were surveyed in classrooms during one school lesson (45 minutes), without the presence of teachers. The students filled out self-completion questionnaires. Before starting to fill in the questionnaire, all the participants were informed that filling in the questionnaire was anonymous and voluntary. Students who decided to participate in the research signed an informed consent to participate in the research. In order to ensure anonymity, these informed consents were submitted separately from the completed questionnaires. The survey included 1,236 first-grade students (550 boys and 637 girls) from 65 classes. Since the target group included students born in 2002, 1,067 students (95% of respondents) born in 2002 were included in the final analysis. A total of 146 questionnaires filled in by students born in 2000 were excluded from the statistical analysis, as well as 23 questionnaires where data on gender and date of birth were missing. The study was approved by the Ethics Committee of the Institute of Public Health of Vojvodina.

Data on the prevalence of marijuana use were obtained based on the question "How many times have you used marijuana (weed, joint) or hashish (cannabis) in your lifetime?". For the purposes of analysis, the responses were grouped into two categories: students who never used marijuana in their lifetime and those who used marijuana at least once in their lifetime. Data on peer risky behaviors were obtained based on questions about the number of friends who smoke cigarettes, drink alcoholic beverages, get drunk, smoke marijuana, use tranquilizers, ecstasy, or inha-

lants. Relationships with friends were assessed based on answers to questions about how often they receive emotional support and attention from their best friend, as well as based on questions about how satisfied they are with their relationships with friends. The Statistical Package for Social Sciences version 11.0, was used for statistical data processing. Descriptive statistics methods were used to describe the target population. The χ^2 test was used to determine the differences in the prevalence of marijuana use between individual groups of respondents. Values of $p < 0.05$ were considered statistically significant.

Results

The research included 1,067 first-grade students from 19 high schools, with slightly more girls (55%) than boys (45%). More than half of the respondents completed the elementary school eighth grade with excellent results (59.7%). Other data on the characteristics of the respondents are shown in **Table 1**.

The prevalence of marijuana use during life was slightly higher among young men (13%) compared to girls (11%), however, this difference was not statistically significant ($\chi^2 = 0.997$; $p = 0.318$). According to the place of residence, the prevalence of marijuana use was twice as high among students living in the city (13.1%) or suburban settlements (13.6%) compared to respondents from rural areas (5.8%) ($\chi^2 = 8.275$; $p = 0.016$). The prevalence of marijuana use was significantly higher among students who had good or poor grades at the end of the eighth grade (26.6%) compared to those who had very good (10.6%) or excellent grades (9.3%) ($\chi^2 = 17.776$; $p < 0.001$) **(Table 2)**.

Every fourth student stated that most or all of their friends smoked cigarettes (26.3%), 57.8% had several friends who smoked, and 15.9% of students did not have any such friends. Marijuana use was significantly more prevalent among students who stated that most of their friends smoked (23.1%) than among those who had fewer friends who smoked ($\chi^2 = 57.519$; $p < 0.001$). Almost half of the respondents answered that most or all of their friends drank alcoholic beverages (46.9%), 42.6% that they have only a few such friends and 10.6% of students did not have a single friend who drank alcoholic beverages. Students whose most or all friends drank alcohol, used marijuana at least once in their lives (15.2%) compared to those who have few or no such friends ($\chi^2 = 17.825$; $p < 0.001$). About a quarter of students stated that most or all of their friends get drunk (23.2%), 52.7% estimated that they have only a few such friends and 24.1% had none such friends. Almost every fourth respondent (22.6%) whose all or most friends get drunk tried marijuana, while significantly fewer respondents without (6.7%) or a few (7.8%) friends who get drunk tried marijuana ($\chi^2 = 41.871$; $p < 0.001$) **(Table 3)**.

Every third student stated that they had several friends who used marijuana (34.6%), and 5.3% of students answered that all or most of their friends used this psychoactive substance. More than half of the students whose all or most friends used marijuana tried marijuana (54%). Among students whose friends did not use marijuana, only 3% tried this drug ($\chi^2 = 154.167$; $p < 0.001$) **(Table 4)**. The largest percentage of students have no friends who used tranquilizers without a doctor's prescription (80.7%), 15.2% have a few such friends, and 1.7% have most/all such friends. As many as 73.3% of students whose most friends used sedatives tried marijuana, significantly more compared to students whose few friends (25%) or none of their friends (7.2%) used sedatives ($\chi^2 = 102.565$; $p < 0.001$). Every sixth student has several friends who used ecstasy (16.4%), 2.9% stated that most or all of their friends used ecstasy, and 80.7% said that they did not have any such friends. The prevalence of marijuana abuse is significantly higher among students whose most/all (63%) or few (28%) friends take ec-

Table 1. Demographic and socio-economic characteristics of respondents
Tabela 1. *Demografske i socio-ekonomske karakteristike ispitanika*

Characteristics of the respondents *Karakternstike ispitanika*	Number of students (•0) *Broj učenika (n)*	Percentage (%) *Procenat (%)*
Gender/*Pol*		
Male/*Muški*	480	45.0
Female/*Ženski*	587	55.0
Place of living/*Mesto stanovanja*		
City/*Grad*	637	59.9
Suburb/*Prigradsko naselje*	236	22.2
Rural areas/*Selo*	191	18.0
Material status of the family in relation to others/*Materijalno stanje porodice u odnosu na druge*		
Better/*Bolje*	346	34.4
The same/*Isto*	514	51.1
Worse/*Lošije*	145	14.4
Student success at the end of the 8th grade/*Uspeh na kraju 8. razreda*		
Excellent/*Odličan*	602	59.7
Very good/*Vrlo dobar*	340	33.7
Good or insufficient/*Dobar ili dovoljan*	66	6.5

Table 2. Prevalence of marijuana use among adolescents in Novi Sad in 2017 according to demographic and socio-economic characteristics
Tabela 2. *Prevalencija upotrebe marihuane kod adolescenata u Novom Sadu u 2017. godini, prema demografskim i socio-ekonomskim karakteristikama*

	Lifetime use of marijuana *Upotreba marihuane tokom života*				p/*p*
	Never/*Nikad*		At least once/*Bar jednom*		
	n/*br.*	%	n/*br.*	%	
Gender/*Pol*					
Male/*Muški*	416	87.0	62	13.0	Z^O.997; p=0.318
Female/*Ženski*	519	89.0	64	11.0	
Place of living/*Mesto stanovanja*					
City/*Grad*	550	86.9	83	13.1	y-%215-, p=0.016
Suburb/*Prigradsko naselje*	204	86.4	32	13.6	
The countryside/*Selo*	179	94.2	11	5.8	
Student success at the end of the 8rd grade/*Uspeh na kraju 8. razreda*					
Excellent/*Odličan*	544	90.7	56	9.3	xM 7.776; pO.001
Very good/*Vrlo dobar*	304	89.4	36	10.6	
Good or insufficient/*Dobar ili dovoljan*	47	73.4	17	26.6	
Material status of the family in relation to others/*Materijalno stanje porodipe u odnosu na druge*					
Better/*Bolje*	307	89.2	37	10.8	χ^2—0.151; p=0.927
Same/*Isto*	457	88.9	57	11.1	
Worse/*Lošije*	125	88.0	17	12.0	

stasy compared to students whose friends did not use this illegal drug (5.7%) ($\chi^2 = 147.443$; $p < 0.001$). The largest percentage of adolescents do not have a single friend who used inhalants (89.9%), 8.3% have several such friends and 1.8% had most or all such friends. Among the respondents whose all friends used inhalants, 82.4% tried marijuana, while significantly lower percentages of marijuana abuse were recorded among respondents whose few (19.3%) or no friends (8.8%) used inhalants ($\chi^2 = 99.409$; $p < 0.001$) **(Table 4)**.

When asked about receiving emotional support from their best friend, about 80% of students estimated that they received it almost always and often (78.9%), and every fifth person said that they rarely or never received it (21.1%). Among students who rarely received support from their best friend, 15.9% of them tried marijuana at least once in their lives, which is significantly more compared to respondents who often received support from their best friend (9.6%). ($\chi^2 = 6.929$; $p = 0.008$). Every fifth adolescent

Table 3. Prevalence of marijuana use among adolescents in Novi Sad in 2017 in regard to the smoking habits and alcohol consumption of their friends
Tabela 3. *Prevalencija upotrebe marihuane kod adolescenata u Novom Sadu u 2017. godini u zavisnosti od navike pušenja i konzumacije alkohola njihovih prijatelja*

	Lifetime use of marijuana *Upotreba marihuane tokom života*				p/*p*
	Never/*Nikad*		At least once/*Bar jednom*		
	n/*br.*	%	n/*br.*	%	
Friends smoke cigarettes/*Prijatelji puše cigarete*					
None/*Nijedan*	143	89.9	16	10.1	χ^2=57.519; pcO.001
A few/*Nekoliko*	548	94.5	32	5.5	
Most or all/*Većina ili svi*	200	76.9	60	23.1	
Friends drink alcoholic beverages/*Prijatelji piju alkoholna pića*					
None/*Nijedan*	94	89.5	11	10.5	χ^2=17.825; pO.OOl
A few/*Nekoliko*	398	93.6	27	6.4	
Most or all/*Većina ili svi*	397	84.8	71	15.2	
Friends get drunk/*Prijatelji se opijaju*					
None/*Nijedan*	224	93.3	16	6.7	χ^2=41.871; pO.OOl
A few/*Nekoliko*	484	92.2	41	7.8	
Most or all/*Većina ili svi*	178	77.4	52	22.6	

Table 4. Prevalence of marijuana use among adolescents in Novi Sad in 2017 in regard to the use of illegal drugs by their friends
Tabela 4. *Prevalencija upotrebe marihuane kod adolescenata u Novom Sadu u 2017. godini u zavisnosti od upotrebe ilegalnih droga njihovih prijatelja*

	Lifetime use of marijuana *Upotreba marihuane tokom života*				p/*p*
	Never/*Nikad*		At least once/*Bar jednom*		
	n/*br.*	%	n/*br.*	%	
Friends smoke marijuana/*Prijatelji puše marihuanu*					
None/*Nijedan*	583	97.0	18	3.0	xM54.167; pO.001
A few/*Nekoliko*	283	81.8	63	18.2	
Most or all/*Većina ili svi*	23	46.0	27	54.0	
Friends use sedatives/*Prijatelji koriste sedative*					
None/*Nijedan*	770	92.8	60	7.2	XM02.565; pO.001
A few/*Nekoliko*	114	75.0	38	25.0	
Most or all/*Većina ili svi*	4	26.7	11	73.3	
Friends use ecstasy/*Prijatelji uzimaju ekstazi*					
None/*Nijedan*	762	94.3	46	5.7	χ^2— 147.443; pcO.OOl
A few/*Nekoliko*	118	72.0	46	28.0	
Most or all/*Većina ili svi*	10	37.0	17	63.0	
Friends use inhalants/*Prijatelji koriste inhalanse*					
None/*Nijedan*	820	91.2	79	8.8	Г-99.409; p<0.001
A few/*Nekoliko*	67	80.7	16	19.3	
Most or all/*Većina ili svi*	3	17.6	14	82.4	

answered that they only sometimes or never received attention from their best friend (21.2%), and 78.7% believed that they received it almost always or often. Among respondents who believed that their best friends almost always or often cared for them, there was a significantly lower prevalence of marijuana use (9.5%) compared to those who believed that their best friends sometimes or never cared for them (16.3%) ($\chi^2 = 8.107$; p = 0.004) **(Table 5)**. The majority of students were satisfied or very satisfied with the relationships with their friends (92.5%). No significant differences were found in the use of marijuana among students who were satisfied and those who were not satisfied with the relationships with their friends ($\chi^2 = 1.175$; p = 0.27) **(Table 5)**.

Discussion

The research was conducted among high school students from Novi Sad using the ESPAD method. The aim of the study was to assess the prevalence of marijuana use among adolescents and differences in prevalence of risky behavior of their friends and relationships with them. Every eighth high school first-

Table 5. Prevalence of marijuana use among adolescents in Novi Sad in 2017 in regard to the relationship with friends
Tabela 5. *Prevalencija upotrebe marihuane kod adolescenata u Novom Sadu u 2017. godini u zavisnosti od odnosa sa prijateljima*

	Lifetime use of marijuana *Upotreba marihuane tokom života*				p/*p*
	Never/*Nikad*		At least once/*Bar jednom*		
	n/*br.*	%	n/*br.*	%	
Emotional support from the best friend/*Emocionalna podrška od najboljeg prijatelja*					
Almost always or often/*Skoro uvek ili često*	727	90.4	77	9.6	χ^2=6.929; p=0.008
Sometimes, rarely or never/*Ponekad, retko ili nikada*	180	84.1	34	15.9	
Attention from the best friend/*Briga od strane najboljeg prijatelja*					
Almost always or often/*Skoro uvek ili često*	727	90.5	76	9.5	χ^2=8.107; p=0.004
Sometimes, rarely or never/*Ponekad, retko ili nikada*	180	83.7	35	16.3	
Satisfaction with relationships with friends/*Zadovoljstvo odnosima sa prijateljima*					
Satisfied/*Zadovoljni*	830	89.5	97	10.5	$\chi^{2=}$ 1.175; p=0.278
Dissatisfied, neither satisfied nor dissatisfied or there is no such person/*Nezadovoljni/ni zadovoljni ni nezadovoljni ili nema takvu osobu*	65	65.5	11	14.5	

grader in Novi Sad used marijuana at least once in their lives. Compared to study conducted in 2012 in Novi Sad, an increase in prevalence was recorded from 8% to 12% [9]. Compared to adolescents in Europe, where the prevalence of cannabis use is 16%, the prevalence of drug abuse is lower among high school students of Novi Sad. The prevalence in Novi Sad is three times lower compared to the Czech Republic, which has the highest prevalence of marijuana use (37%) out of all the countries included in the ESPAD survey. Countries where the prevalence is similar to that in Novi Sad are Denmark (12%), Georgia (11.0%), Hungary (13%) and Malta (13%) [6]. Lifetime prevalence of marijuana abuse is higher among young men (13%) than among girls (11%), but not significantly. In both sexes, among Novi Sad students, there was an increase in the abuse of cannabis compared to 2012, especially among girls, whose prevalence increased from 6.4% to 11% [9]. In most European countries, the prevalence is also higher in boys compared to girls [6, 7]. Twice as many students from the city and suburbs used marijuana compared to students living in the rural areas, which is in line with research conducted in Serbia in 2008, according to which young people from urban areas regularly use illegal drugs more often than adolescents from smaller cities and rural areas [21]. This research showed that the prevalence of marijuana use was significantly higher among students who had good or poor results (failed, repeated the grade) at the end of the elementary school eighth grade, compared to students who had very good or excellent results. Multiple studies have shown that early marijuana use is associated with poor school performance [22, 23]. The link between early marijuana use and education is hypothesized to be due to the social context in which cannabis is used. Early cannabis use appears to be associated with the adoption of anti-conventional lifestyle characterized by belonging to delinquent and substance-using peers, even dropping out of school [23, 24]. In addition, the research shows that the use of marijuana leads to a decline in mental functions [25], but also those adolescents who start using marijuana have a lower IQ compared to their peers who do not use it [26]. Adolescents' behavior is greatly influenced by the behavior of their peers [20] and even at this age it is stronger than the influence of the family [15, 17]. The influence of peers on the use of marijuana is strongest in the adolescent period, and then significantly decreases in the mid-twenties [14]. A group of authors from New Zealand found that peer influence on marijuana use was significantly greater in 14- to 15-year-olds than in 20- to 21-year-olds [27]. The prevalence of marijuana use among adolescents in Novi Sad is significantly higher among students whose most (or all) friends smoke cigarettes, consume alcohol, or use marijuana. The fact that more than half of the students whose friends smoke marijuana also use it, while on the other hand, only 3% of respondents who do not have friends who use marijuana have used it. Other studies also confirm that adolescents who have friends who consume psychoactive substances use marijuana in a higher percentage than adolescents whose peers do not approve of this behavior [28]. Peer approval or use of marijuana can be a strong motivator for an adolescent to also try marijuana [29]. It is also possible that adolescents who use psychoactive substances find friends who have similar behavior patterns, as stated by authors from Canada [30]. It is considered that the use of psychoactive substances has a significant social role. If adolescents start using cigarettes, alcohol or marijuana, new social opportunities open up for them, such as new friendships and situations where the use of psychoactive substances dominates. Not only do friends influence marijuana use, by creating situations in which marijuana is used, but also the use of psychoactive substances can be the entry ticket to new friendships [30]. Adolescents in Novi Sad who felt they had less support and attention from their best friends used marijuana more often. The influence of an adolescent's best friend stands out as the strongest form of peer influence on marijuana use. His influence is stronger than the influence of parents and other peers [31]. On the other hand, according to research from California on the effects of socialization on the use of marijuana, the stronger influence of peers is felt among adolescents whose relationship is reciprocal (friends mutually influence each other), because it is precisely such a relationship that allows a young person to try this drug, following the example of a peer [19]. Negative experiences in peer relationships increase the risk of marijuana use, and in this context marijuana use is seen as an attempt to reduce the impact of these negative experiences [32]. Although this research provided insight into the prevalence of marijuana use and the existence of an association between adolescent marijuana use and risky peer behaviors, it also has its limitations. One of the main limitations of the study is that it is a cross-sectional study that does not allow establishing cause-and-effect relationships. Despite this shortcoming, significant data were obtained on marijuana use patterns that can be used for designing preventive programs aimed at preventing adolescent marijuana use.

Conclusion

The prevalence of marijuana use among adolescents in Novi Sad is high and amounts to 12%. In regard to the place of residence, the prevalence of marijuana abuse is twice as high among students who live in the city or suburbs compared to respondents from the rural areas. The prevalence of marijuana use is significantly higher among students who had good or poor results at the end of the elementary school eighth grade compared to those who had very good or excellent results. Peers have a significant influence on adolescent marijuana use. The prevalence of marijuana use among adolescents in Novi Sad is significantly higher among students whose friends smoke cigarettes, drink alcoholic beverages, and get drunk, smoke marijuana, use tranquilizers, ecstasy or inhalants. The prevalence is also higher among students who feel that they do not receive enough support and attention from their best friend.

References

1. Vlada Republike Srbije. Strategija razvoja zdravlja mladih u Republici Srbiji. Službeni glasnik RS. 2005;(71).

2. Sawyer SM, Afifi RA, Bearinger LH, Blakemore SJ, Dick B, Ezeh AC, et al. Adolescence: a foundation for future health. Lancet. 2012;379(9826):1630-40.

3. Loke AY, Mak YW. Family process and peer influences on substance use by adolescents. Int J Environ Res Public Health. 2013;10(9):3868-85.

4. Feinstein EC, Richter L, Foster SE. Addressing the critical health problem of adolescent substance use through health care, research, and public policy. J Adolesc Health. 2012;50(5):431-6.

5. Marschall-Lévesque S, Castellanos-Ryan N, Vitaro F, Séguin JR. Moderators of the association between peer and target adolescent substance use. Addict Behav. 2014;39(1):48-70.

6. European Monitoring Centre for Drugs and Drug Addiction. ESPAD Report 2015: results from the European school survey project on alcohol and other drugs. Luxembourg: EUR-OP; 2016.

7. Hibell B, Guttormsson U, Ahlström S, Balakireva O, Bjarnason T, Kokkevi A, et al. The 2011 ESPAD report: substance use among students in 36 European countries. Stockholm: The Swedish Council for Information on Alcohol and Other Drugs (CAN); 2012.

8. European Monitoring Centre for Drugs and Drug Addiction. European drug report 2018: trends and developments. Luxembourg: Publications Office of the European Union; 2018.

9. Radić I. Zloupotreba ilegalnih droga kod adolescenata u Novom Sadu [specijalistički rad]. Novi Sad: Medicinski fakultet; 2013.

10. Johnson JK. Elucidating the impact of adolescent marijuana use. J Adolesc Health. 2018;63(2):129-30.

11. Nguyen NN. Factors influencing adolescent alcohol and marijuana use: the role of religiosity, school-based prevention programs, parental influence, and peer influence [dissertation]. Boston: University of Pittsburgh; 2015.

12. World Health Organization. Health for the world's adolescents. A second chance in the second decade. Geneva: WHO; 2014.

13. Bandura A. Social learning theory. New York: Prentice-Hall, Englewood Cliffs; 1977.

14. Beardslee J, Datta S, Byrd A, Meier M, Prins S, Cerda M, et al. An examination of parental and peer influence on substance use and criminal offending during the transition from adolescence to adulthood. Crim Justice Behav. 2018;45(6):783-98.

15. Ferguson CJ, Meehan DC. With friends like these…: peer delinquency influences across age cohorts on smoking, alcohol and illegal substance use. Eur Psychiatry. 2011;26(1):6-12.

16. Marotta P. Exploring relationships between delinquent peer groups, participation in delinquency, substance abuse, and injecting drug use among the incarcerated: findings from a national sample of state and federal inmates in the United States. J Drug Issues. 2017;47(3):320-39.

17. Allen M, Donohue WA, Griffin A, Ryan D, Turner MM. Comparing the influence of parents and peers on the choice to use drugs: a meta-analytic summary of the literature. Crim Justice Behav. 2003;30(2):163-86.

18. Oetting ER, Beauvais F. Peer cluster theory: drugs and the adolescent. J Couns Dev. 1986;65(1):17-22.

19. Tucker JS, de la Haye K, Kennedy DP, Green HD Jr, Pollard MS. Peer influence on marijuana use in different types of friendships. J Adolesc Health. 2014;54(1):67-73.

20. Rubin KH, Bukowski WM, Bowker JC. Children in peer groups. In: Bornstein MH, Leventahl T, Lerner RM, editors. Handbook of child psychology and developmental science. New Jersey: Wiley; 2015. p. 175-222.

21. Ministarstvo zdravlja Republike Srbije, Institut za javno zdravlje „Dr Milan Jovanović Batut". Evropsko istraživanje o upotrebi alkohola i drugih droga među mladima u Srbiji 2008. Beograd: Ministarstvo zdravlja Republike Srbije, Institut za javno zdravlje „Dr Milan Jovanović Batut"; 2009.

22. Fergusson DM, Horwood J, Beautrais AL. Cannabis and educational achievement. Addiction. 2003;98(12):1681-92.

23. Lynskey M, Hall W. The effects of adolescent cannabis use on educational attainment: a review. Addiction. 2000;95(11):1621-30.

24. Lynskey MT, Coffey C, Degenhardt L, Carlin JB, Patton G. A longitudinal study of the effects of adolescent cannabis use on high school completion. Addiction. 2003;98(5):685-92.

25. Meier MH, Caspi A, Ambler A, Harrington H, Houts R, Keefe RS, et al. Persistent cannabis users show neuropsychological decline from childhood to midlife. Proc Natl Acad Sci U S A. 2012;109(40):E2657-64.

26. Meier MH, Caspi A, Danese A, Fisher HL, Houts R, Arseneault L, et al. Associations between adolescent cannabis use and neuropsychological decline: a longitudinal co-twin control study. Addiction. 2018;113(2):257-65.

27. Fergusson DM, Swain-Campbell NR, Horwood LJ. Deviant peer affiliations, crime and substance use: a fixed effects regression analysis. J Abnorm Child Psychol. 2002;30(4):419-30.

28. Moeser DJ. Marijuana use by juveniles: the effects of peers, parents race, and drug abuse resistance education [thesis]. Johnson City: East Tennessee State University; 2005.

29. Mason WA, Russo MJ, Chmelka MB, Herrenkohl RC, Herrenkohl TI. Parent and peer pathways linking childhood experiences of abuse with marijuana use in adolescence and adulthood. Addict Behav. 2017;66:70-5.

30. Poulin F, Kiesner J, Pedersen S, Dishion TJ. A short-term longitudinal analysis of friendship selection on early adolescent substance use. J Adolesc. 2011;34(2):249-56.

31. Schuler MS, Tucker JS, Pedersen ER, D'Amico EJ. Relative influence of perceived peer and family substance use on adolescent alcohol, cigarette, and marijuana use across middle and high school. Addict Behav. 2019;88:99-105.

32. Caouette JD, Feldstein Ewing SW. Four mechanistic models of peer influence on adolescent cannabis use. Curr Addict Rep. 2017;4(2):90-9.

Rad je primljen 18. IX 2022.
Recenziran 21. IX 2022.
Prihvaćen za štampu 21. IX 2022.
BIBLID.0025-8105:(2022):LXXV:5-6:182-188.