

Original article

doi:10.5633/amm.2025.0209

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Originalni rad

doi:10.5633/amm.2025.0209

Konsumiranje alkohola među studentima prve i druge godine fakulteta u Novom Sadu

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AMM Paper Accepted

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Alcohol consumption among first and second-year university students in Novi Sad

Alcohol is the most consumed psychoactive substance worldwide. The aim is to assess the prevalence of alcohol consumption among university students in Novi Sad and the association of socioeconomic characteristics and psychoactive substance use with alcohol consumption.

The study was a cross-sectional survey of University of Novi Sad students in 2019, as part of the project „Health behaviors of students: benefits and risk” funded by the Provincial Secretariat for Higher Education and Scientific Research. The research involved 644 students from thirteen faculties. The study instrument was an online questionnaire and alcohol consumption was classified by daily intake units. The association between socioeconomic characteristics and psychoactive substance use and alcohol use was analyzed using the Chi-square or Fisher’s Exact test.

Two of five students drank alcohol more than once a month (43.2%), and only 15,5% reported that they never drank alcohol. Half of students (50.2%) reported binge drinking, with a higher prevalence among men than women (64.2% vs. 44.1%) ($p < 0.001$). Around 4% (3.8%) of students believe that they drink more alcohol due to peer influence than they would otherwise, with a higher prevalence among young men than women (7.0% vs. 2.4%) ($p < 0.001$). The prevalence of heavy drinking and binge drinking was higher among smokers and illicit drug users ($p < 0.001$).

The prevalence of alcohol use and binge drinking among university students in Novi Sad is high. Peers have a negative influence on student alcohol use. Heavy drinking and binge drinking were more prevalent among smokers and illicit drug users.

Key words: alcohol drinking, binge drinking, peer influence, smoking, illicit drugs

Konsumiranje alkohola među studentima prve i druge godine fakulteta u Novom Sadu

Alkohol je najviše konzumirana psihoaktivna supstanca na svetu. Cilj je proceniti prevalenciju konzumiranja alkohola među studentima Univerziteta u Novom Sadu i povezanost socioekonomskih karakteristika i upotrebe psihoaktivnih supstanci sa konzumiranjem alkohola.

Studija je sprovedena kao studija preseka među studentima Univerziteta u Novom Sadu 2019. godine, u okviru projekta „Zdravstveno ponašanje studenata: koristi i rizici” koji je finansirao Pokrajinski sekretarijat za visoko obrazovanje i naučnoistraživačku delatnost. U istraživanju je učestvovalo 644 studenata sa trinaest fakulteta. Instrument istraživanja bio je onlajn upitnik, a konzumacija alkohola klasifikovana je prema dnevnim jedinicama unosa. Povezanost između socioekonomskih karakteristika i upotrebe psihoaktivnih supstanci i upotrebe alkohola analizirana je korišćenjem Hi-kvadrat testa ili Fišerovog testa egzaktnosti.

Dvoje od pet studenata pilo je alkohol više od jednom mesečno (43,3%), a samo 15,5% je izjavilo da nikada nisu pili alkohol. Polovina studenata (50,2%) prijavila je opijanje, sa većom prevalencijom kod muškaraca nego kod žena (64,2% naspram 44,1%) ($p < 0,001$). Oko 4% (3,8%) studenata veruje da pije više alkohola zbog uticaja vršnjaka nego što bi inače, sa većom prevalencijom među mladim muškarcima nego ženama (7,0% naspram 2,4%) ($p < 0,001$). Prevalencija prekomerne konzumacije alkohola i opijanja bila je veća među pušačima i korisnicima nedozvoljenih droga ($p < 0,001$).

Prevalencija konzumiranja alkohola i opijanja među studentima Univerziteta u Novom Sadu je visoka. Vršnjaci imaju negativan uticaj na upotrebu alkohola među studentima. Prekomerna konzumacija alkohola i opijanje bili su češći među pušačima i korisnicima nedozvoljenih droga.

Ključne reči: konzumiranje alkohola, opijanje, uticaj vršnjaka pušenje, nedozvoljene droge

Introduction:

Alcohol is the most often consumed psychoactive substance in the world [1]. In 2016, according to global statistics, alcohol was the seventh risk factor for both deaths and disability-adjusted life years (DALYs), which emphasizes the seriousness of this public health problem [2]. Alcohol consumption among young people represents a serious public health challenge that requires a thorough analysis of risk factors in order to develop effective prevention strategies [3]. According to the data of the European School Survey Project on Alcohol and Other Drugs (ESPAD), in almost all countries, more than half of students reported drinking alcohol at least once in their lives. In ESPAD countries, 47% of students reported alcohol use in the last 30 days, and an average of 13% of students reported being intoxicated in the last 30 days. Based on data from the ESPAD project in Serbia, 87% of students was reported consuming alcohol at least once during their lifetime, 56% of students reported alcohol use in the last 30 days and 12% of students reported being intoxicated in the last 30 days [4]. The COVID-19 pandemic significantly influenced global alcohol consumption, with a trend of decreasing alcohol consumption among young people [5]. Early onset and intensive alcohol consumption during the period of adolescence can have long-term consequences on the brain development, including hypoglycemia in certain parts of the cerebral cortex and increased risk of addiction [6]. The binge drinking can reduce cognitive abilities and motor skills which leads to increased risk of injury, accidents, and risky sexual behavior [7]. The influence of alcohol on the ability to drive is pronounced, especially in young drivers, which leads to an increased risk of severe head injuries and fatal accidents [8]. Drivers under the influence of alcohol show a tendency to accidents during parking, which directly depends on the level of alcohol in the blood [9].

In 2019, alcohol was the cause of 156.000 deaths and 10 million lost years of healthy life due to traffic injuries caused by drivers under the influence of alcohol [5]. The mortality rate in our country was 1.3 per 100.000 inhabitants due to the same circumstances, according to data from the Road Traffic Agency of the Republic of Serbia in the same year [10,11]. A study from Serbia in 2019 showed that every hundredth driver drives under the influence of alcohol [12].

It is important to understand the factors that affect alcohol consumption among young in order to successfully design preventive programs. Special emphasis should be placed on family support, changes in norms in peer groups and community influence on attitudes towards alcohol. Social and cultural influences, as they are family models, social norms, and media

influence, are key in the formation of attitudes and habits of young people towards alcohol. Family influence is one of the first and the most significant factors that shape the perception of young people about alcohol. Peers often function as role models and can exert direct pressure on young people to adhere to certain norms related to alcohol. Increased alcohol consumption is also affected by individual characteristics [3]. Increased alcohol consumption can also be influenced by the fact that students are exposed to elevated levels of stress during their studies [13].

Aim: The aim is to assess the prevalence of alcohol consumption among first- and second-year university students in Novi Sad and the association of socioeconomic characteristics and the use of other psychoactive substances with alcohol consumption.

Method:

The study is a part of the project „Health behaviors of students - benefits and risks“ financed by the Provincial Secretariat for Higher Education and Scientific Research. This cross-sectional study was conducted among students at the University of Novi Sad in the year 2019. Study included 664 students (456 first-year and 208 second-year students) from the following faculties: Faculty of Medicine (43.1%), Faculty of Technical Sciences (12.5%), Faculty of Law (7.1%), Faculty of Sciences (7.1%), Faculty of Agriculture (6.3%), Faculty of Sport and Physical Education (6.3%), Faculty of Economics (5.9%), Faculty of Education (5.6%), Faculty of Philosophy (1.7%), „Mihajlo Pupin“ Technical Faculty (1.4%), Faculty of Technology (0.9%), Academy of Arts (0.6%) and other faculties (0.2%).

The instrument of the study was an online questionnaire with electronic consent for participation in the study. Link to the questionnaires was given to the first and second-year students after lectures. The questionnaire included questions on demographics (gender, age, and year of the study), socio-economic status (self-assessed material status of the family), and questions on lifestyle factors (cigarette smoking, electronic cigarette smoking, water pipe smoking, marijuana use, ecstasy use, amphetamine use, and sedative or sleeping pills use without a prescription). The outcome variables were alcohol consumption and binge drinking. According to answers on alcohol consumption on a typical day (number of alcohol units), students were categorized into three groups: students who never drink, moderate drinking (1-2

alcohol units daily), and heavy drinking (three or more alcohol units daily). Binge drinking was defined as having six or more drinks on a single occasion.

Statistical analysis:

Descriptive and inferential statistics methods were used for data analysis. Categorical variables were presented as frequencies and percentages, and numerical variables as means and standard deviations. The Chi-square or Fisher's Exact test was used to test the association between socioeconomic characteristics and the use of other psychoactive substances and alcohol use. Statistically significant were considered p -values less than 0.05. The statistical analyses were done using the IBM Statistical Package for the Social Sciences (IBM SPSS).

Ethical considerations:

Participation in the study was anonymous and voluntary. The ethical aspects of the study were approved by The Ethics Committee of the Institute of the Public Health of Vojvodina, Novi Sad (Approval number: 01-340/2).

Results:

The sample included 664 students (69.7% females and 30.3% males) of average age 19.8 (SD=1.43) (min 18 and max 38 years). More than half of the students assessed their material status as average (55.6%), 40.4% as good, and 4.1% as bad. Around 43% of students were from the Faculty of Medicine (Table 1). Other characteristics of the sample are presented in Table 1.

Table 1. Sample characteristics, by gender, Novi Sad 2019

Characteristic	Total	Men	Women	p -value*
	n (%)	n (%)	n (%)	
Age (years)				
18-19	325 (49.3)	91 (45.7)	234 (50.9)	0.444
20-21	300 (45.5)	96 (48.2)	204 (44.3)	
22+	34 (5.2)	12 (6.0)	22 (4.8)	
Faculty				
Medicine	286 (43.1)	78 (38.8)	208 (44.9)	0.168
Other	378 (56.9)	123 (61.2)	255 (55.1)	
Year of the study				
First	456 (68.7)	128 (63.7)	328 (70.8)	0.042
Second	208 (31.3)	73 (36.3)	135 (29.2)	
Material status of				

of family												
Good	36 (13.6)	97 (36.7)	131 (49.6)	0.261	8 (9.1)	28 (31.8)	52 (59.1)	0.619	28 (15.9)	69 (39.2)	79 (44.9)	0.550
Average	62 (16.8)	157 (42.7)	149 (40.5)		14 (13.9)	37 (36.6)	50 (49.5)		48 (18.0)	120 (44.9)	99 (37.1)	
Bad	4 (14.8)	11 (40.7)	12 (44.4)		2 (20.0)	3 (30.0)	5 (50.0)		2 (11.8)	8 (47.1)	7 (41.2)	
Total	102 (15.5)	265 (40.2)	292 (44.3)	-	24 (12.1)	68 (34.2)	107 (53.8)	-	78 (17.0)	197 (42.9)	185 (40.2)	-

*Chi-square test

Binge drinking was widespread among students. Approximately half of the students reported binge drinking (50.2%), sometimes multiple times per month. Every third student binge drank less than once monthly (33.3%), 13.7% binge drank at least once monthly, 2.9% at least once weekly, and 0.5% reported binge drinking almost every day or daily. Binge drinking was significantly more prevalent among young men (64.2%) than girls (44.1%) ($p < 0.001$). There were no significant differences in binge drinking according to age, type of faculty, year of the study, and material status of the family (Table 3).

Table 3. Prevalence of binge drinking according to socio-demographic characteristics of students, Novi Sad 2019

Characteristic	Total			Men			Women		
	No n (%)	Yes n (%)	p-value*	No n (%)	Yes n (%)	p-value*	No n (%)	Yes n (%)	p-value*
Gender									
Men	72 (35.8)	129 (64.2)	<0.001	-	-		-	-	-
Women	259 (55.9)	204 (44.1)		-	-		-	-	
Age (years)									
18-19	168 (51.7)	157 (48.3)	0.654	30 (33.0)	61 (67.0)	0.734	138 (59.0)	96 (41.0)	0.442
20-21	144 (48.0)	156 (52.0)		36 (37.5)	60 (62.5)		108 (52.9)	96 (47.1)	
22+	18 (50.0)	16 (50.0)		5 (41.7)	7 (58.2)		12 (54.5)	10 (45.5)	
Faculty									
Medicine	152 (53.1)	134 (46.9)	0.158	31 (39.7)	47 (60.3)	0.440	121 (58.2)	87 (41.8)	0.218
Other	179 (47.4)	199 (52.6)		41 (33.3)	82 (66.7)		138 (54.1)	117 (45.9)	
Year of the study									
First	233 (51.1)	223 (48.9)	0.358	42 (32.8)	86 (67.2)	0.305	191 (58.2)	137(41.8)	0.124
Second	98 (47.1)	110 (52.9)		30 (41.1)	43 (58.9)		68 (50.4)	67 (49.6)	
Material status of family									
Good	130 (48.5)	138 (51.5)	0.832	30 (33.7)	59 (66.3)	0.590	100 (55.9)	79 (44.1)	0.966
Average	187 (50.7)	182 (49.3)		36 (36.3)	65 (63.7)		150 (56.2)	117 (43.8)	
Bad	14 (51.9)	13 (48.1)		5 (50.0)	5 (50.0)		9 (52.9)	8 (47.1)	
Total	331 (49.8)	333 (50.2)	-	72 (35.8)	129 (64.2)	-	259 (55.9)	204 (44.1)	-

*Chi-square test or Fisher's exact test

Around 4% of students (3.8%) believe that due to the influence of their friends, they drink more alcohol than they would otherwise. This influence was significantly more prevalent among young men (7.0%) than girls (2.4%) ($p < 0.001$) (Table 4).

Table 4. Influence of friends on higher alcohol consumption according to gender, Novi Sad 2019

Gender	Higher alcohol consumption due to friend's influence			<i>p</i> -value*
	No	Sometimes	Always	
	n (%)	n (%)	n (%)	
Men	116 (57.7)	71 (35.3)	14 (7.0)	<0.001
Women	329 (71.1)	123 (26.6)	11 (2.4)	
Total	445 (67.0)	194 (29.2)	25 (3.8)	

*Chi-square test

The higher influence of friends on drinking behaviour was associated with higher alcohol consumption and more prevalent binge drinking among students. This association was significant in both genders. Among students who said that they always drink more due to the influence of friends, 87.5% reported heavy drinking, and 80% reported binge drinking (Table 5).

Table 5. Influence of friends on higher alcohol consumption and binge drinking, Novi Sad 2019

Higher alcohol consumption and binge drinking due to friend's influence	Alcohol consumption			<i>p</i> -value*	Binge drinking		<i>p</i> -value*
	Never	Moderate	Heavy		No	Yes	
	n (%)	n (%)	n (%)		n (%)	n (%)	
Total							
No	96 (21.7)	184 (41.6)	162 (36.7)	<0.001	260 (58.4)	185 (41.6)	<0.001
Sometimes	6 (3.1)	78 (40.4)	109 (56.5)		66 (34.0)	128 (66.0)	
Always	0 (0.0)	3 (12.5)	21 (87.5)		5 (20.0)	20 (80.0)	
Men							
No	22 (19.1)	45 (39.1)	48 (41.7)	<0.001	56 (48.3)	60 (51.7)	<0.001
Sometimes	2 (2.8)	22 (31.0)	47 (66.2)		14 (19.7)	57 (80.3)	
Always	0 (0.0)	1 (7.7)	12 (92.3)		2 (14.3)	12 (85.7)	
Women							
No	74 (22.6)	139 (42.5)	114 (34.9)	<0.001	204 (62.0)	125 (38.0)	<0.001

Sometimes	4 (3.3)	56 (45.9)	62 (50.8)		52 (42.3)	71 (57.7)	
Always	0 (0.0)	2 (18.2)	9 (81.8)		3 (27.3)	8 (72.7)	

*Chi-square test

Among first and second-year university students 22.1% were smokers and 9.2% were former smokers. Electronic cigarettes were used by 2.6% of students and water pipes by 5.9%. Every fifth student consumed marijuana at least once in a lifetime (21.4%). Ecstasy was used by 4.4% of students and amphetamines by 2.0% of students. Every sixth student (17.3%) used sedatives or sleeping pills without a doctor's prescription.

The prevalence of heavy drinking was significantly higher among smokers (62.6%) than among non-smokers (37.8%) ($p < 0.001$). Binge drinking was also more prevalent among smokers (63.9%) than non-smokers (43.2%) ($p < 0.001$). Electronic cigarette smoking was associated with a higher prevalence of heavy drinking, but not with binge drinking. Among students who reported marijuana use, 63.8% were heavy drinkers, while this percentage was 39% among those who never used marijuana. The use of ecstasy and amphetamines was associated with a higher prevalence of heavy drinking, as well as with binge drinking. The use of sedatives or sleeping pills was not associated with alcohol consumption and binge drinking (Table 6).

Table 6. Association of cigarette smoking and illicit drug use with alcohol consumption and binge drinking, Novi Sad 2019

	Alcohol consumption			<i>p</i> -value*	Binge drinking		
	Never n (%)	Moderate n (%)	Heavy n (%)		No n (%)	Yes n (%)	<i>p</i> -value*
Smoking							
Non-smoker	94 (20.8)	187 (41.4)	171 (37.8)	<0.001	259 (56.8)	197 (43.2)	<0.001
Former smoker	2 (3.3)	29 (48.3)	29 (48.3)		19 (31.1)	42 (68.9)	
Smoker	6 (4.1)	49 (33.3)	92 (62.6)		53 (36.1)	94 (63.9)	
Electronic cigarettes							
Non-smoker	102 (16.2)	258 (40.9)	271 (42.9)	0.009	322 (50.6)	314 (49.4)	0.133
Former smoker	0 (0.0)	4 (36.4)	7 (63.6)		3 (27.3)	8 (72.7)	
Smoker	0 (0.0)	3 (17.6)	14 (82.4)		6 (35.3)	11 (64.7)	

Water pipe smoking							
Never	92 (17.6)	221 (42.2)	211 (40.3)	<0.001	286 (54.1)	243 (45.9)	<0.001
Yes, before	9 (9.4)	36 (37.5)	51 (53.1)		39 (40.6)	57 (59.4)	
Yes	1 (2.6)	8 (20.5)	30 (76.9)		6 (15.4)	33 (84.6)	
Marijuana							
Never	96 (18.5)	220 (42.5)	202 (39.0)	<0.001	296 (56.7)	226 (43.3)	<0.001
At least once	6 (4.3)	45 (31.9)	90 (63.8)		35 (24.7)	107 (75.4)	
Ecstasy							
Never	102 (16.2)	258 (41.0)	270 (42.9)	<0.001	327 (51.5)	308 (48.5)	<0.001
At least once	0 (0.0)	7 (24.1)	22 (75.9)		4 (13.8)	25 (86.2)	
Amphetamine							
Never	102 (15.8)	262 (40.6)	282 (43.7)	0.045	330 (50.7)	321 (49.3)	0.003
At least once	0 (0.0)	3 (23.1)	10 (76.9)		1 (7.7)	12 (92.3)	
Sedatives or sleeping pills							
Never	92 (16.9)	218 (40.0)	235 (43.1)	0.080	282 (51.4)	267 (48.6)	0.101
At least once	10 (8.8)	47 (41.2)	57 (50.0)		49 (42.6)	66 (57.4)	

*Chi-square test or Fisher's exact test

Discussion:

This study estimated the prevalence of alcohol consumption among university students in Novi Sad and its relationship with socioeconomic characteristics and the use of other psychoactive substances. Two of five students in our study consumed alcohol once a month or less often (41.3%). The average prevalence of alcohol consumption among students in Europe was 47% during the past 30 days, with the highest prevalence of alcohol use in Denmark (74%) [4]. There are large variations in alcohol consumption among university students in and outside European countries. The lowest risk for alcoholism is among Asians compared to Europeans and African Americans because Asians have genetic variation and react with more intense unpleasant reactions when consuming alcohol [14]. Every sixth student from our research answered that they never drink alcohol. In the Spain study, 7.8% of students did not drink

alcohol during the last year [15]. According to the results of our questionnaire, men drink alcohol more often than women, which is consistent with other studies [16,17]. Also, in most European countries from the ESPAD project men drink alcohol more often than women [4].

This research paper showed that 44% of students drink heavily on a typical day. More than half of Norwegian students reported drinking five or more alcoholic drinks on a typical day when drinking, which is more compared to our study. Among students, heavy drinking is considered normal, which is certainly worrying [17]. Excessive alcohol consumption can lead to many diseases like cancers, liver cirrhosis, and heart disease to the transmission of HIV infection and it can be lethal [5].

Our results showed that half of the students reported binge drinking. More than 30% of students reported binge drinking in Hungary, which is less compared to our study [18]. Asian authors have concluded that over time, as students progress through their years of study, the propensity for binge drinking increases [19]. University students who prefer binge drinking especially extreme ones (10+ drinks/occasion) had lower scores on the logical memory subtest [20,21]. Extreme prepartying and drinking games in college can lead to intoxication and negative consequences. The frequency of prepartying and participation in drinking games was linked to an increased risk of extreme drinking among students [22]. The prevalence of binge drinking was higher among young men than girls, but according to age, type of faculty, year of the study and material status, we didn't find significant differences. Like in our study, binge drinking is reported more often in male students in other studies [19,23].

Almost 4% of students in our study reported that they always drink more alcohol under the influence of friends and less than a third of students believe that under the influence of friends, they sometimes drink more alcohol than usual. These results are also confirmed in some other studies. According to the study of Salame et al., peer influence has a more significant effect on the harmful use of alcohol. This study shows that people often neglect all potential dangers related to alcohol due to peer pressure and influence [24]. Schaefer et al. recorded that students drink alcohol weekly seven times more if their friends also drink weekly [25].

Our study produced results that indicate that 87.5% of students under the influence of friends always drink heavily. In the study Schaefer et al., around 30% of students reported binge drinking in the past two weeks. Under the influence of peers, students engage in binge

drinking 6.8 times more often [25]. The influence of friends on higher alcohol consumption and binge drinking is more pronounced in men than in women in our study.

In our research, more than 20% of students were cigarette smokers, while a much smaller percentage of students used electronic cigarettes and water pipes. Cigarette smokers and water pipe smokers were more prone to heavy drinking and binge drinking. Meanwhile, electronic cigarette smokers had a higher prevalence of heavy drinking, but not binge drinking. In a cross-sectional multicentric study conducted in Germany and Hungary, 18% of students were cigarette smokers, and, as in our study, a much smaller percentage of students used electronic cigarettes and water pipes [26]. The worrying fact is that every fifth student tried marijuana at least once in a life according to our study. Other types of illicit drugs like ecstasy and amphetamines are less frequently used. Higher alcohol consumption was associated with the use of illicit drugs like marijuana and ecstasy. The use of sedatives and sleeping pills was not associated with higher alcohol consumption, which is positive because simultaneous consumption of sedatives or sleeping pills with even a small amount of alcohol can lead to overdose, sleepiness, dizziness, slowed or difficulty breathing and can be potentially fatal [27]. At the university, students have easy access to alcohol and illicit drugs and consume these substances for a sense of belonging and interaction with other peers. Students at the university in Spain most often combine alcohol with cannabis [28]. According to a Spanish study conducted among university students, every third binge drinker has tried cannabis [29]. Students less often use ecstasy and amphetamine according to the study conducted in the United Kingdom, which is the same as in our study [30]. According to the authors from Hungary, binge drinking is associated with smoking and illicit drug use [18].

Medical students play a key role in the promotion and display of healthy habits because their knowledge and example can influence their peers to adopt healthy lifestyles [31]. Unfortunately, our study didn't find any differences between medical students and others. Appropriate education programs are needed to reduce early and intensive alcohol use among young people. Ridoult et al. suggested introducing messages about safe alcohol use to students on Facebook [32]. There is less consumption in countries that have limitations in terms of shop working hours, licenses for the retail sale of alcohol outside the premises, and legal drinking age provisions [33].

One of the limitations of the study is that a questionnaire was used to collect responses, which may lead to some distortion of the results. However, due to the anonymous nature of the questionnaire, we believe that students were less likely to be dishonest. The second limitation of the study is that it includes only first- and second-year university students, while older students are not included.

Conclusions:

The prevalence of alcohol use and binge drinking among university students in Novi Sad is high and it is more prevalent among young men than women. The study shows that peers have a negative influence on student alcohol use. The prevalence of heavy drinking and binge drinking was higher among students who reported that they always drink more due to the influence of friends. Smoking and the use of illegal drugs are linked to heavy drinking and more frequent binge drinking among students.

Acknowledgment: The authors are grateful to the Provincial Secretariat for Higher Education and Scientific Research, Autonomous Province of Vojvodina, who funded this study (Grant number 401-7380/2018).

Abbreviations:

Disability-adjusted life years (DALY)

European School Survey Project on Alcohol and Other Drugs (ESPAD)

IBM Statistical Package for the Social Sciences (IBM SPSS)

References:

1. Degenhardt L, Chiu WT, Sampson N, Kessler RC, Anthony JC, Angermeyer M, et al. Toward a global view of alcohol, tobacco, cannabis, and cocaine use: findings from the WHO World Mental Health Surveys. *PLoS Med.* 2008;5(7):e141. DOI: 10.1371/journal.pmed.0050141.
2. Griswold MG, Fullman N, Hawley C, Arian N, Zimsen SRM, Tymeson HD, et al. Alcohol use and burden for 195 countries and territories, 1990-2016: a systematic analysis for the Global Burden of Disease Study 2016. *The Lancet.* 2018;392(10152):1015–1035. DOI: 10.1016/S0140-6736(18)31310-2.
3. Sudhinaraset M, Wigglesworth C, Takeuchi DT. Social and cultural contexts of alcohol use: influences in a social-ecological framework. *Alcohol Res.* 2016;38(1):35–45. PMID: 27159810
4. ESPAD Group. ESPAD Report 2019: Results from the European school survey project on alcohol and other drugs. Luxembourg: Publications Office of the European Union; 2020. DOI:10.2810/877033
5. World Health Organization. Global status report on alcohol and health and treatment of substance use disorders. Geneva: World Health Organization; 2024.
6. Hua JPY, Piasecki TM, McDowell YE, Boness CL, Trela CJ, Merrill AM, et al. Alcohol use in young adults associated with cortical gyrification. *Drug and Alcohol Depend.* 2020;209:107925. DOI: 10.1016/j.drugalcdep.2020.107925.
7. O'Brien MC, McCoy TP, Champion H, Mitra A, Robbins A, Teuschlser H, et al. Single question about drunkenness to detect college students at risk for injury. *Acad Emerg Med.* 2006;13(6):629–36. DOI: 10.1197/j.aem.2005.12.023.
8. Riuttanen A, Jääntti SJ, Mattila VM. Alcohol use in severely injured trauma patients. *Sci Rep.* 2020;10(1):17891. DOI: 10.1038/s41598-020-74753-y.
9. Tank A, Tietz T, J. Loskant, Zube K, S. Ritz-Timme, Hartung B. Parking behaviour under the influence of alcohol. *Int J Legal Med.* 2023;137(6):1735–41. DOI: 10.1007/s00414-023-03082-2.
10. Road Traffic Safety Agency [homepage on the Internet]. Republic of Serbia: The integrated database on characteristics of traffic safety [cited 2024 Aug 19]. Available from: <http://195.222.99.60/ibbsPublic/>.

11. Statistical Office [homepage on the Internet]. Republic of Serbia: Estimates of population by age and sex (beginning, middle and end of year) [cited 2024 Aug 19]. Available from:
<https://data.stat.gov.rs/Home/Result/18010403?languageCode=sr-Cyrl>.
12. Pešić D, Antić B, Smailović E, Marković N. Driving under the influence of alcohol and the effects of alcohol prohibition: case study in Serbia. *Traffic Inj Prev*. 2019;20(5):467–71. DOI: 10.1080/15389588.2019.1612058.
13. Jović S, Odović G, Nikolić M, Jovanović T, Mladenović S. Sources of stress among university students and coping methods. *Acta Med Mediana*. 2023;62(4):55–62. DOI: 10.5633/amm.2023.0407.
14. Oota H, Pakstis AJ, Bonne-Tamir B, Goldman D, Grigorenko E, Kajuna SL, et al. The evolution and population genetics of the ALDH2 locus: random genetic drift, selection, and low levels of recombination. *Ann Hum Genet*. 2004;68(2):93–109. DOI: 10.1046/j.1529-8817.2003.00060.x.
15. Herrero-Montes M, Alonso-Blanco C, Paz Zulueta M, Pellico-Lopez A, Ruiz Azcona L, Sarabia-Cobo C, et al. Excessive alcohol consumption and binge drinking in college students. *PeerJ*. 2022;10:e13368. DOI: 10.7717/peerj.13368.
16. Stock C, Mikolajczyk R, Bloomfield K, Maxwell AE, Ozcebe H, Petkeviciene J, et al. Alcohol consumption and attitudes towards banning alcohol sales on campus among European university students. *Public Health*. 2009;123(2):122–9. DOI: 10.1016/j.puhe.2008.12.009.
17. Myrtveit SM, Askeland KG, Knudsen AK, Knapstad M, Olsen R, Nedregård T, et al. Risky drinking among Norwegian students: associations with participation in the introductory week, academic performance and alcohol-related attitudes. *Nord Stud Alcohol Drugs*. 2016;33(4):361–80. DOI: 10.1515/nsad-2016-0031.
18. Lukács A, Szabó A, Horváth E, Máté Z, Erdős C, Molnár R, et al. Students in danger: binge drinking behaviour and associated factors in Hungary. *Zdr Varst*. 2021;60(4):244–52. DOI: 10.2478/sjph-2021-0033.
19. Yi S, Ngin C, Peltzer K, Pengpid S. Health and behavioral factors associated with binge drinking among university students in nine ASEAN countries. *Subst Abuse Treat Prev Policy*. 2017;12(1):32. DOI: 10.1186/s13011-017-0117-2.

20. Parada M, Corral M, Caamaño-Isorna F, Mota N, Crego A, Holguín SR, et al. Binge drinking and declarative memory in university students. *Alcohol Clin Exp Res.* 2011;35(8):1475–84. DOI: 10.1111/j.1530-0277.2011.01484.x.
21. Nguyen-Louie TT, Tracas A, Squeglia LM, Matt GE, Ebersson-Shumate S, Tapert SF. Learning and memory in adolescent moderate, binge, and extreme-binge drinkers. *Alcohol Clin Exp Res.* 2016;40(9):1895–904. DOI: 10.1111/acer.13160.
22. Fairlie AM, Maggs JL, Lanza ST. Prepartying, drinking games, and extreme drinking among college students: a daily-level investigation. *Addict Behav.* 2015;42:91–5. DOI: 10.1016/j.addbeh.2014.11.001.
23. Bedendo A, Andrade ALM, Opaleye ES, Noto AR. Binge drinking: a pattern associated with a risk of problems of alcohol use among university students. *Rev Latinoam Enfermagem.* 2017;25:e2925. DOI: 10.1590/1518-8345.1891.2925.
24. Salamé J, Barbour B, Salameh P. Do personal beliefs and peers affect the practice of alcohol consumption in university students in Lebanon? *East Mediterr Health J.* 2013;19(4):340-7. PMID: 23882959.
25. Schaefer DR, Van Woerden I, Hruschka D, Bruening M. Finding and Keeping Friends in College and Their Influence on Alcohol Use: A Network Analysis. *J Stud Alcohol Drugs.* 2021 Jan;82(1):121–31. DOI: 10.15288/jsad.2021.82.121.
26. Balogh E, Faubl N, Riemenschneider H, Balázs P, Bergmann A, Cseh K, et al. Cigarette, waterpipe and e-cigarette use among an international sample of medical students: Cross-sectional multicenter study in Germany and Hungary. *BMC Public Health.* 2018;18(1):591. DOI: 10.1186/s12889-018-5494-6.
27. National Institute on Alcohol Abuse and Alcoholism. Harmful interactions: mixing alcohol with medicines [homepage on the Internet]. National Institute on Alcohol Abuse and Alcoholism; 2003. [cited 2024 Aug 19]. Available from: https://www.niaaa.nih.gov/sites/default/files/publications/Harmful_Interactions.pdf.
28. Jones S E, Oeltmann J, Wilson T W, Brener N D, Hill C V. Binge Drinking Among Undergraduate College Students in the United States: Implications for Other Substance Use. *J Am Coll Health.* 2001;50(1):33–38. DOI: 10.1080/07448480109595709.
29. Herrero-Montes M, Alonso-Blanco C, Paz-Zulueta M, Sarabia-Cobo C, Ruiz-Azcona L, Parás-Bravo P. Binge drinking in Spanish university students:

- associated factors and repercussions: a preliminary study. *Int J Environ Res Public Health*. 2019;16(23):4822. DOI: 10.3390/ijerph16234822.
30. Palin M, McConville K. Prevalence and Perceptions of Illicit Substance Use Amongst Medical Students. *MedEdPublish*. 2021;10:163. DOI: 10.15694/mep.2021.000163.1
31. Tavoracci MP, Boerg E, Richard L, Meyrignac G, Dechelotte P, Ladner J. Prevalence of binge drinking and associated behaviours among 3286 college students in France. *BMC Public Health*. 2016;16:178. DOI: 10.1186/s12889-016-2863-x.
32. Ridout B, Campbell A. Using Facebook to deliver a social norm intervention to reduce problem drinking at university. *Drug Alcohol Rev*. 2014;33(6):667-73. DOI: 10.1111/dar.12141.
33. Cook WK, Bond J, Greenfield TK. Are alcohol policies associated with alcohol consumption in low- and middle-income countries? *Addiction*. 2014;109(7):1081-90. DOI: 10.1111/add.12571.

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