

# Alcohol consumption among adolescents in Kraljevo, Serbia

Research Article

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**Abstract:** The aim of this study was to investigate the prevalence and predictors of alcohol consumption among adolescents in one town in Central Serbia. A questionnaire was used to obtain data from 191 Serbian students aged 18 years regarding personal experience with alcohol consumption and cigarette smoking, along with sociodemographics data. Alcohol consumption was reported by 97.4% subjects, with 34.9% having the first experience with alcohol at the age of 14 years or less. Binge drinking (the intake of five or more drinks at one sitting) was reported by 37.8% subjects. Significantly higher consumption of beer ( $p < 0.0001$ ) and spirits ( $p = 0.03$ ) was observed in boys. The most common reason for both initiation and continuation of drinking, regardless of gender, were celebrations ( $p \geq 0.12$ ). Smokers were more likely than nonsmokers to consume all alcoholic beverages more frequently ( $p \leq 0.04$ ) and in larger quantities ( $p \leq 0.004$ ). More frequent or more extensive alcohol consumption, or both, was associated in boys with frequent going out and socializing ( $p \leq 0.01$ ), close peer relationship ( $p = 0.04$ ), alcohol abuse within the immediate environment ( $p \leq 0.04$ ), better financial status of family ( $p = 0.04$ ), and parental criticism ( $p \leq 0.02$ ); in girls, it was associated with parental disapproval ( $p \leq 0.02$ ), alcohol abuse within the immediate environment ( $p \leq 0.04$ ), and general discontentedness ( $p = 0.049$ ). Regardless of gender, positive alcohol outcome expectancies increased alcohol consumption ( $p \leq 0.048$ ), and negative expectancies decreased intake ( $p \leq 0.047$ ).

**Keywords:** Alcohol • Adolescents • Risk factors • Serbian

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## 1. Introduction

Adolescence is an important time of life, characterized by intense changes in physiological, psychological, and social development [1]. Although it is generally considered to be a period of good health, it carries a significant risk for the development of behavior that can compromise health, such as excessive consumption of alcohol [2,3]. The consequences of this kind of lifestyle are often serious, including academic or legal problems, unwanted sexual experiences, illnesses, injuries, or even death [4,5].

Alcohol abuse among adolescents is widely recognized as a common and important public health problem [5-8]. Previous studies focusing on this issue revealed that the causes of excessive alcohol consumption usually comprise not only psychological and demographic factors, but also different social and economic factors [2,4,9,10], suggesting that the scope and nature of this problem may differ among countries.

Although numerous investigations have been conducted worldwide to describe alcohol abuse by youth [1-3,10-15], the data from our country are still insufficient. The aim of the present study was to investigate the prevalence and predictors of alcohol consumption among adolescents in one town in Central Serbia.

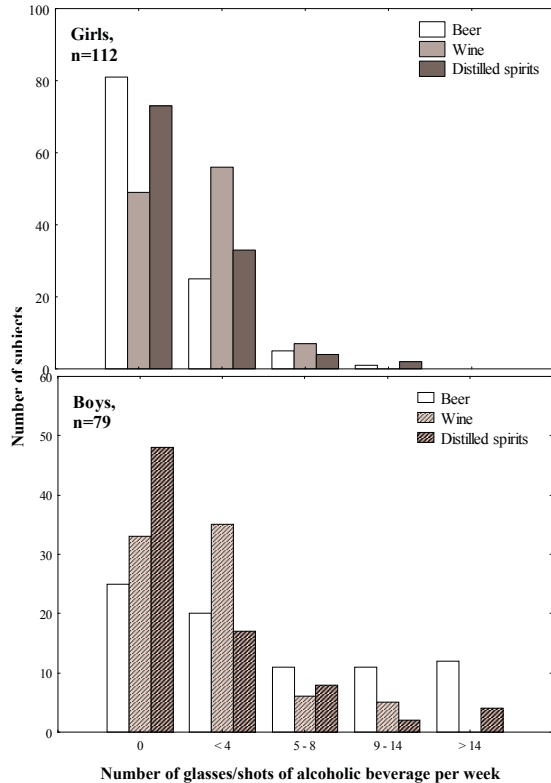
## 2. Material and Methods

A total of 191 fourth-year students from four different high schools in Kraljevo, Serbia, participated in the study. All participants were 18 years old, and they were enrolled in the study after providing signed, written informed consent. The study was approved by the school authorities and the ethics committee at the Medical Faculty, University of Kragujevac, Serbia.

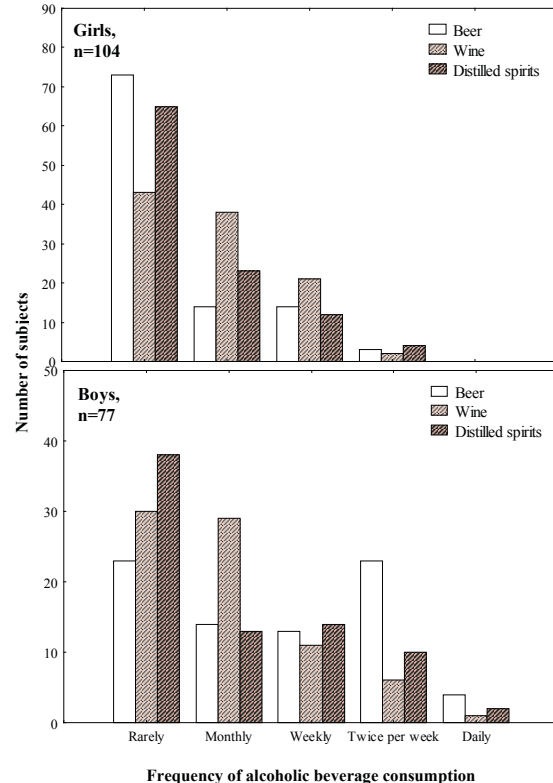
For the study, we developed a questionnaire based on data from the literature [1-5,7,10,13,15] and asked students to anonymously fill it out during a school class.

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**Figure 1.** The frequency distributions of the alcohol consumption intensity, stratified according to gender.



**Figure 2.** The frequency distributions of the alcohol consumption frequency, stratified according to gender.



The questionnaire consisted of 20 questions concerning personal experience with alcohol consumption; attitudes, expectancies and knowledge of alcohol use; sociodemographic data; psychological characteristics; leisure-time activities; and information on cigarette smoking.

### 2.1. Statistical methods

Statistical analyses were performed with Statistica, version 7.1 (StatSoft Inc, Tulsa, USA). Absolute numbers and frequencies were used as descriptive statistics, and the calculations of the 95% confidence interval (CI) were according to the modified Wald method. Chi-square and Mann-Whitney tests were used to assess the effect of different variables on the frequency and intensity of alcohol consumption. For all statistical procedures,  $p < 0.05$  was considered as significant.

## 3. Results

The percentage of answered questions in the study sample was 97.5%. There were 112 girls (58.6%; 95% CI: 51.5-65.4) and 37 (19.4%; 95% CI: 14.4-25.6) who were smokers among the participants. At least one

alcohol consumption ever was reported by 186 students (97.4%; 95% CI: 93.8-99.0), with 120 (65.4%; 95% CI: 57.4-71.0) having had this experience for the first time between 15 and 18 years of age, and 65 (34.9%; 95% CI: 28.5-42.1) at the age of 14 years or less.

Figures 1 and 2 show the frequency distributions of current alcohol consumption intensity and frequency, stratified according to gender. Significantly higher consumption of beer, in terms of both intensity and frequency, was observed in boys ( $p < 0.0001$ ). Furthermore, boys consumed spirits more frequently ( $p = 0.03$ ), but not in higher quantities. However, no significant differences were observed between genders in terms of wine intake. In addition, boys consumed significantly more beer ( $p < 0.0001$ ), wine ( $p = 0.003$ ), and spirits ( $p = 0.005$ ) per drinking occasion compared to girls. Binge drinking, defined as the intake of five or more drinks on one occasion, was reported by 66 persons (37.8%; 95% CI: 30.8-45.4): 37 boys (50.7%; 95% CI: 39.5-61.8) and 6 girls (9.5%; 95% CI: 4.2-19.7) reported drinking beer; 20 boys (28.6%; 95% CI: 19.3-40.1) and 10 girls (11.0%; 95% CI: 6.0-19.3) wine; and 20 boys (29.9%; 95% CI: 20.2-41.7) and 13 girls (16.7%; 95% CI: 9.9-26.7) spirits.

**Table 1.** The frequency distribution of the current alcohol consumption intensity and frequency, experienced symptoms and problems related to alcohol consumption among adolescents, stratified according to the gender.

	Girls		Boys	
	Frequency	95% CI	Frequency	95% CI
Initiation of alcohol consumption				
At the celebration/at the party	0.87 (97/112)	0.79; 0.92	0.81 (63/79)	0.71; 0.88
Curiosity	0.08 (9/112)	0.04; 0.15	0.17 (13/79)	0.10; 0.26
Peer influence	0.00 (0/112)	0.00; 0.04	0.01 (1/79)	0.00; 0.08
Low mood	0.02 (2/112)	0.00; 0.07	0.00 (0/79)	0.00; 0.06
Reasons for continuing alcohol consumption				
With friends/at the celebration/at the party	0.94 (105/112)	0.87; 0.97	0.94 (74/79)	0.86; 0.98
To get high/to get drunk	0.01 (1/112)	0.00; 0.06	0.04 (3/79)	0.01; 0.11
Loneliness/personal problems	0.00 (0/112)	0.00; 0.04	0.01 (1/79)	0.00; 0.08
Effects of alcohol consumption*				
Palpitations, euphoria, mood change	0.47 (53/112)	0.38; 0.57	0.49 (39/79)	0.39; 0.60
Impaired walk, impaired caution	0.53 (59/112)	0.44; 0.62	0.66 (52/79)	0.55; 0.75
Slurred speech, ataxia, vomiting	0.49 (55/112)	0.40; 0.58	0.58 (46/79)	0.47; 0.69
Social problems related to alcohol consumption*				
Arguments with others	0.04 (4/112)	0.01; 0.09	0.11 (9/79)	0.06; 0.21
Fights with others	0.01 (1/112)	0.00; 0.06	0.11 (9/79)	0.06; 0.21
Injuries	0.06 (7/112)	0.03; 0.13	0.24 (19/79)	0.16; 0.35
Breaking the law	0.00 (0/112)	0.00; 0.04	0.05 (4/79)	0.02; 0.13

\* experienced at least once

Celebrations or parties were identified as the most common reason for the drinking initiation and as the usual setting for regular alcohol consumption (Table 1), regardless of gender ( $p \geq 0.12$ ). More than half of the subjects reported experiencing one or more effects of alcohol consumption on at least one occasion (Table 1). Male and female students alike experienced mild symptoms of alcohol intake, such as palpitations, euphoria, or mood change, at a similar rate ( $p = 0.39$ ), whereas males were more likely to have had other, more severe consequences of alcohol intoxication ( $p \leq 0.01$ ). Social problems related to alcohol consumption were rarely reported (Table 1). Compared to nonsmokers, smokers were more likely to consume all alcoholic beverages more frequently ( $p \leq 0.04$ ) and in larger quantities ( $p \leq 0.004$ ). Psychological characteristics such as organizational skills, practicality, independence, adjustability, and mood, as well as leisure-time activities, did not affect the frequency or intensity of alcohol consumption.

The presence of a regular alcohol user in the immediate environment, either as a family member (3.1%; 95% CI: 1.3-6.9) or a friend (56.0%; 95% CI: 48.9-62.9), was associated with the consumption of an increased quantity of beer ( $p \leq 0.04$ ) and distilled spirits ( $p \leq 0.045$ ), although it did not affect the frequency of drinking or intake of wine. Boys and girls whose

friends occasionally used alcohol reported a greater intensity of beer consumption ( $p = 0.02$ ), whereas more frequent consumption of beer was detected only in boys ( $p = 0.04$ ). In addition, more frequent and more extensive beer consumption was observed in boys who socialized often ( $p = 0.01$  and  $p = 0.003$ , respectively) or were often criticized by their family members ( $p = 0.009$  and  $p = 0.02$ , respectively). Boys who could turn to their friends when they had problems also tended to drink beer more frequently ( $p = 0.04$ ).

More frequent wine consumption was observed in boys who perceived their families to be wealthier than others ( $p = 0.04$ ) or who could show their emotions openly ( $p = 0.0006$ ). If they perceived themselves skilled in problem-solving, boys were prone to more frequent alcohol consumption in general ( $p = 0.04$ ), as well as to drinking increased quantities of wine ( $p = 0.01$ ). Girls whose families did not respect their decisions consumed wine more frequently ( $p = 0.02$ ) and more abundantly ( $p = 0.01$ ), whereas they drank distilled spirits more frequently ( $p = 0.049$ ) if they were not content with their lives.

The frequency distributions of alcohol outcome expectancies and knowledge of the effects of alcohol consumption among adolescents are presented in Table 2, with no significant differences between boys and girls ( $p \geq 0.86$ ). The expectancy that alcohol should

**Table 2.** The frequency distribution of alcohol expectancies and knowledge of the effects of alcohol consumption among adolescents, stratified according to the gender.

	Girls		Boys	
	Frequency	95% CI	Frequency	95% CI
Positive alcohol expectancies				
Alcohol cause social lubrication	0.27 (30/112)	0.20; 0.36	0.34 (27/79)	0.25; 0.45
Alcohol cause tension reduction	0.55 (61/112)	0.45; 0.63	0.63 (50/79)	0.52; 0.73
Negative alcohol expectancies				
Alcohol cause increased aggression	0.35 (39/112)	0.27; 0.44	0.39 (31/79)	0.29; 0.50
Alcohol cause impaired judgment	0.46 (52/112)	0.38; 0.56	0.51 (40/79)	0.40; 0.61
Knowledge of the effects of alcohol consumption				
People differently endure alcohol	1.00 (112/112)	0.96; 1.01	1.00 (79/79)	0.94; 1.01
Alcohol may cause acute intoxication	0.65 (73/112)	0.56; 0.73	0.51 (40/79)	0.40; 0.61
Food slow down alcohol intoxication	0.87 (97/112)	0.79; 0.92	0.84 (66/79)	0.74; 0.90
Alcohol may cause liver disease	0.98 (110/112)	0.93; 1.00	0.89 (70/79)	0.80; 0.94
Alcohol does not cause lung cancer	0.95 (106/112)	0.89; 0.98	0.94 (74/79)	0.86; 0.98

reduce tension was associated with a higher consumption of alcohol in girls ( $p \leq 0.047$ ) and increased intake of beer by boys ( $p \leq 0.048$ ). In addition, girls who believed that alcohol consumption increases aggression drank less beer and distilled spirits ( $p = 0.02$ ), whereas boys with the same negative expectancy drank beer less frequently ( $p = 0.047$ ). Girls drank beer less frequently ( $p \leq 0.04$ ) and both beer and distilled spirits less extensively ( $p \leq 0.047$ ), when they were aware that alcohol consumption decreases judgment abilities. In addition, girls who knew that alcohol may cause acute intoxication drank a decreased quantity of distilled spirits ( $p = 0.048$ ).

## 4. Discussion

Because alcohol consumption among young people represents a serious public health problem in most countries, numerous investigations have been conducted [16,17]. Here we analyze and present the scope and nature of alcohol use among 18-year-old adolescents in one town in Serbia. The main limitations of our study are its cross-sectional design, which restricts our ability to draw definite conclusions on causality between the risk factors studied and the drinking behavior observed, and the lack of generalizability; because the subjects were recruited from a single town and the study sample was rather small, it may not be representative of youth living in other parts of Serbia. Although our investigation provides insight into alcohol consumption among Serbian adolescents, the results require cautious interpretation, as well as additional confirmation by longitudinal studies involving more subjects.

It has been shown that initiation of drinking in early adolescence carries a considerable risk for later development of alcohol abuse or dependence [3,5,9,17-22], and experimentation with alcoholic beverages often takes place at a very young age [23]. According to previous reports, every third 11-year-old American child [22] and every fourth 12-year-old Swiss child [3] has already had experience with alcohol. Other investigators studying Finnish and Indian youth, however, have observed a mean age of drinking initiation at 17 and 18 years, respectively [15,18]. In our study, two thirds of the Serbian adolescents reported a first drinking occasion before completing high school, while the other third had the same experience while attending elementary school. Despite these obvious inter-country variations in behavior, nearly all adolescents worldwide have already consumed alcohol by the time they reach 18 years of age [3,17,18,24-28]. Furthermore, more than half of our study subjects reported being intoxicated at least once, supporting the results of previous surveys [3,10,16,29]. These observations suggest that the onset of alcohol consumption might be dependent on sociodemographic factors, but drinking in late adolescence seems to be a universal problem. Therefore, interventions to reduce alcohol consumption in adolescence need to be implemented globally. They should be evidence-guided and appropriately designed for all age groups, including elementary-school students. In order to delay drinking initiation and decrease the level of alcohol consumption, government policies need to be applied regarding a minimum legal drinking age, as well as restriction of the marketing and promotion of alcohol.

Binge drinking (consuming five or more drinks in one sitting), which is widely accepted as one of the valid

indicators of alcohol consumption [22,24,29], is known to increase with age [28,30]. Observers have found that every third American [22,29], Australian [24] and South African [31] teen entering late adolescence has engaged in binge drinking. Our findings were in accordance with the previously published observations [16], since binge drinking was reported by every third 18-year-old Serbian adolescent. This pattern of alcohol consumption in many studies, like ours, appears to be gender-dependent; boys were more prone to binge drinking than girls [22,24,29,31,32]. Furthermore, we found that the rate of binge drinking is beverage-dependent. Specifically, beer was consumed much more often in binge drinking than wine or distilled spirits, which is most probably due to cultural and social influences [2,8,33]. This type of drinking represents hazardous behavior that leads to dangerous elevation of alcohol concentration in the blood and accordingly increases the risk of serious alcohol-related adverse health consequences [24,34-36]. Therefore, we propose that prevention strategies for binge drinking be obligatory in all public health promotion programs, with additional concern for male teenagers and a special focus on the beverages preferred in a particular cultural setting.

It is well known that adult men consume more alcohol than adult women [15,22,37], but the gender differences in drinking behavior among adolescents are not yet fully established. In our study, Serbian 18-year-old boys reported higher beer and spirits consumption, as well as a higher binge drinking rate, compared to girls of the same age. Likewise, a number of previous studies investigating Australian [24], Croatian [2], English [35], Spanish [30] and Swiss [3] school populations aged between 10 and 19 years clearly identified male gender as a predictor of higher alcohol consumption. However, other researchers investigating groups of Hispanic [14], Spanish [1,23], Finnish [38], and Brazilian [27] adolescents, as well as other European [21] and American [28] adolescents, failed to find a consistent, or even any, effect of gender on drinking behavior [17,22]. It has been suggested that gender-specific patterns of drinking are age-dependent, which could explain the observed discrepancy if a difference in alcohol intake between boys and girls does not occur until late adolescence [1,22,23,28,39,40]. In addition, the prevalence of alcohol consumption among adolescents in general increases with age [8,22,23,25,30,41]. Boys entering young adulthood are more at risk of excessive alcohol intake probably due to physiological factors such as lower alcohol reactivity and higher tolerance rates, but adoption of social norms that support stereotypes of masculinity may also have a role [22]. Therefore, we suggest that boys, especially in late adolescence,

should be the focus of the development of strategies to prevent excessive alcohol use.

Identification of the scope of adolescent alcohol consumption certainly stresses the need for prevention and intervention. Yet, to improve effectiveness of the prospective alcohol-related strategies, it is critical to discover and understand the causes and risk factors for drinking in adolescence [4,17,24]. A number of previous studies showed that the leading motives for drinking among adolescents often involve social aspects, with alcohol as a lifestyle element that defines one's social identity [4,9,42-46]. Teens usually consume alcohol at celebrations or parties where drinking is encouraged, with the intention to avoid social rejection, facilitate interactions with others, and to have fun [1,2,15,17,42,45,47-49]. Similar to previous observations, we discovered social gatherings and going out with friends to be the most common drinking initiators among Serbian youth. In addition, a higher family financial status was associated with increased alcohol consumption in Serbian adolescents, as well as in Baltic [10] and Spanish [30] youth. Obviously, socializing significantly influences adolescents' risk behavior [2,49], and access to money increases access to alcohol [15]. Promoting a healthy lifestyle by limiting alcohol availability and providing alcohol-free social and recreational options could decrease adolescents' alcohol consumption.

Adolescence as a period of life is unique by the length of time spent with friends, making a teenager much more susceptible to peer pressure and vulnerable to initiation of risky habits [14,15,23,25,47]. Furthermore, the drinking behavior of friends seems to be the most universal predictor of adolescent alcohol consumption [14,17,22,50,51]. In an attempt by adolescents to adjust their behavior to the norms of a peer group, they frequently adopt the pattern of their friends' alcohol consumption [22]. Numerous studies have reported that affiliation with drinking peers very often leads to an adolescent's alcohol initiation and heavy alcohol use [2,17,19,20,23,35,45-47,50,52], and our results fully support these observations. Therefore, in order to overcome the undesirable influence of deviant peer groups and reduce adolescent drinking, we need to consider active participation of the media in creation and imposition of positive role models for young people.

A family history of alcohol use, as well as poor relations with parents, seems to significantly increase the likelihood of teenagers' early drinking initiation [2,7,9,14,15,17,22,23,35,46,51-56], although the findings have not always been consistent [11,38]. In the present study, excessive alcohol consumption by a family member, parental disapproval, and lack

of esteem negatively influenced adolescent drinking behavior. Family therapy could reduce the risk of adolescents' alcohol consumption, because it would not only promote a better relationship and open and quality communication between parents and their children but also educate adults about the harmful effects of alcohol use.

Alcohol consumption is frequently regarded as a way of dealing with psychological stress and negative emotions [3,7]. Therefore, certain personal characteristics, such as inadequate coping strategies, an inappropriate value system, or lack of self-esteem [3,4,17,38,57], might help to identify those who are at increased risk for initiation of drinking [58]. However, in our study, both girls who were discontent with their lives and boys who were content with their problem-solving skills were more prone to alcohol consumption. Apparently, adolescents' drinking behavior is complicated by psychological aspects that are not always so easily understood, since they are in turn tempered by a number of environmental, social, and gender features. Still, these aspects need to be detected and explored, so that teenagers at risk can be offered guidance and help in negotiating their way through adolescence.

Drinking behavior is often influenced by knowledge about alcohol effects, experience that creates either positive or negative alcohol-related outcome expectancies, or both [20,22,25,26,59]. These expectancies represent strong predictors of alcohol consumption, because many reports have confirmed that drinking takes place when the positive evaluations prevail over negative ones [4,9,17,20,23]. Adolescence is characterized by lower risk perceptions and less self-control, thus advertising positive alcohol effects to teenagers lacking in knowledge might be detrimental to strategies for preventing excessive adolescent drinking [45,58,59]. In our study, most of the Serbian adolescents were well informed about the health effects of alcohol consumption. Many of them were familiar with the positive aspects of drinking, but they were not aware of the negative consequences, which made them more vulnerable to alcohol consumption.

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Finally, despite the substantial health risks associated with tobacco use, cigarettes are among the most commonly used substances in adolescence [24,29,60]. In addition, cigarette smoking in adolescents is strongly associated with drinking behavior in terms of both alcohol initiation and consumption [14,15,17,23,29,38,40,46,51]. It is known that addictive behavior among adults usually has its roots in abuse of both alcohol and tobacco during adolescence [9,18,20,21,24,41]. Additionally, smoking and drinking seem to increase the odds of the development of abuse of other substances, regardless of gender or age [17,27,29,38,40,49,61,62]. In our study, we observed a higher frequency and intensity of alcohol use among smokers, which corresponds well with previously published results. To decrease the risk of alcohol consumption, as well as other substance abuse or dependence, prevention strategies should be focused on reduction of both drinking and cigarette smoking in adolescence.

In conclusion, the present investigation of Serbian adolescents' drinking habits revealed early drinking initiation and high rates of binge drinking. Male gender and cigarette smoking increased the risk of alcohol consumption in adolescence, and active participation in celebrations or parties was the most common reason for both drinking initiation and continuation. Interpersonal relations with friends and family and their alcohol consumption, as well as personal alcohol-related expectancies, significantly influenced adolescent drinking behavior in Serbia.

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