

Contribution of Socio-Demographic and Structured Leisure Activities' Characteristics to Adolescents' Alcohol Use

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BACKGROUND: Leisure can be a context that can promote positive adolescent development, but it can also be a context that contributes to adolescents engaging in risk behaviours. **AIMS:** The aim of this study is to determine the extent to which socio-demographic characteristics, the frequency of adolescent participation in structured leisure activities (SLA), and the type of SLA contribute to adolescent alcohol use and to examine the moderating effects of gender, age, and type of SLA on the relationship between the frequency of adolescent participation in SLA and adolescent alcohol use. **METHODS:** The study was conducted from April to June 2021 as part of a research project examining leisure and risk behaviours in Croatia. The sample consisted of students who reported having participated in SLA (N = 1431). The participants were between 14 and 21 years old (44.8% female). The Questionnaire of Youth Leisure Time and the CTC Youth Survey were used. Multinomial logistic regression analysis and Poisson regression were used to achieve the aim of this article. **RESULTS:** The

results indicate that gender, age, and the type of SLA have an influence on adolescent alcohol use. Males and older adolescents who participated in SLA used more alcohol. The type of SLA in which adolescents participate influences the pathway of alcohol use. In addition, the results confirmed the moderating effect of the type of SLA on the relationship between the frequency of adolescent participation resulting from the constraints imposed by the COVID-19 pandemic and adolescent alcohol use. Accordingly, more frequent participation in group sports, performance/fine arts, and educational activities acts as a protective factor and reduces the likelihood of risky alcohol use, whereas more frequent participation in community-oriented activities acts as a risk factor and increases the likelihood of risky alcohol use. **CONCLUSIONS:** When planning and implementing preventive interventions within the leisure context, it is important to consider that gender, age, and the type of SLA may influence the risk of adolescent alcohol use, and interventions need to take these findings into account to be effective.

Keywords | Structured Leisure Time (SLA) – Gender – Adolescent – Type of Activity – Frequency – Alcohol Use

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1 INTRODUCTION

Adolescence is an important developmental period characterized by behaviours such as increased excitability, impulsivity, reward preference, and a tendency to spend leisure time with peers (Choudhury et al., 2006; Hamidullah et al., 2020; Romer, 2010). Leisure can be a context that can promote positive adolescent development, but it can also be a context that contributes to young people's engagement in risk behaviours such as alcohol use.

It is important to understand the patterns of substance use, from experimentation and occasional use to habituation and dependence. Multiple pathways are involved in this process, there is no single cause, and it depends largely on individual choices influenced by internal, biological, and external environmental and social factors (European Monitoring Centre for Drugs and Drug Addiction [EMCDDA], 2020). Factors such as substance use at a young age, the use of different types of substances, experience gained while using substances, exposure to comprehensive preventive interventions, and a combination of many risk and protective factors influence the speed of transition from the phase of experimentation with substances to the development of addiction (EMCDDA, 2020).

Epidemiological data at the Croatian and European levels shows the importance of preventive interventions for adolescent substance use. In relation to the early onset of substance use, the results of the European School Survey Project on Alcohol and Other Drugs (ESPAD) survey show that one in three ESPAD students have used alcohol at age 13 or younger, with a European average of 33% and a Croatian average of 42%. Alcohol intoxication at age 13 or younger is reported by 6.7% of European and 8% of Croatian secondary school students (ESPAD Group, 2020). The international study Health Behaviour in School-aged Children (HBSC) shows that alcohol is the substance most frequently consumed by 15-year-olds. In addition, the results generally show that boys have more experience with drunkenness than girls at all ages (38% of boys vs. 33% of girls; Inchley et al., 2020). At the same time, the proportion of boys in Croatia who have been drunk two or more times in their lifetime is higher than the HBSC country average for boys of all the ages that were observed (Capak, 2020). Recent data on substance use in Croatia comes from the Laboratory for Prevention Research (PrevLab), ERF UNIZG (2019), which conducted a survey of 10,138 high school students aged 14–19 years. Of all substances, adolescents were most likely to consume alcohol. In total, 70.4% of them had used alcohol in the past 30 days and 32.8% of them had used alcohol in the past week. There are gender differences, showing that the boys consume alcohol more often than the girls (72.2% of the boys and 69.1% of the girls consumed alcohol once a month or more). At the same time, age differences in alcohol consumption were found in the survey, with the trend showing that alcohol consumption increased with the age of adolescents (53.15% of first-grade students, 69.6% of second-grade students, 78.17% of third-grade students, and 84.25% of fourth-grade students). When analysing this data, we should keep in mind that the distribution and sale of alcohol to adolescents under the age of 18 is prohibited by law in Croatia.

One of the fundamental characteristics of adolescence is the search for one's own identity, often accompanied by a strong desire for independence from adults, first from parents, then from teachers and other authority figures. During this period, adolescents become increasingly concerned about their leisure time. Some researchers consider leisure as the fourth developmental context (Silbereisen & Todt, 1994), along with the family, school, and work environments. Thus, leisure (compared to school, family, and work) is important because it provides numerous and unique opportunities to achieve developmental outcomes. Leisure is usually defined as a freely chosen activity that involves meaningful, intrinsically motivated, and enjoyable experiences outside of fixed obligations such as school or work (Godbey, 1994; Kim et al., 2018). In addition, leisure is valued as a human right and an important environment for positive development, but it can also serve as an environment for the development of risk behaviours (Caldwell, 2008).

The Leisure Activity-Context-Experience Model (LACE model) is a model that focuses on understanding adolescent development through leisure (Caldwell, 2005). The model assumes that a combination of activity, context, and quality of experience influences the emergence of positive or negative leisure experiences (Caldwell & Faulk, 2013; Caldwell & Witt, 2018). Activity classification is important because it allows the right questions for exploration to be asked and essential statements to be made about the issues associated with activities and time use (Caldwell, 2008), and one of the most commonly used classifications relates to structured and unstructured leisure activities. Structured leisure activities (SLA) are characterized by a clear structure with defined rules and goals, are supervised by adults, have a regular schedule, and emphasize skill building (Larson, 2000). Precisely because of these characteristics, SLA is believed to contribute to positive adolescent development, unlike other types of leisure activities (Bartko & Eccles, 2003). On the other hand, unstructured, informal, and passive leisure activities are often associated with risky behaviours or have no impact on building skill and competence, i.e. they are not thought to contribute to positive developmental outcomes (Mahoney et al., 2001; Caldwell, 2008).

Adolescents who participate in SLA are less likely to engage in risky behaviours and more likely to demonstrate improved academic performance and positive psychosocial behaviours (Badura et al., 2018; Bartko & Eccles, 2003; Caldwell & Witt, 2011; Zaff et al., 2003). In addition, Mahoney et al. (2010) reported the results of a meta-analysis of 43 studies of extracurricular activities among children aged five to 14 years and showed that children and adolescents who participated in extracurricular activities were less likely to use substances or be arrested and/or change their attitudes toward substance use. Among the various types of leisure activities, many studies have focused on sports. Team sports are thought to contribute to the health and well-being of participants (Oberle et al., 2019). However, there are studies that show that participation in sports activities per se is not always associated with lower substance use. Some research suggests that participation in sports activities is associated with substance use, particularly in relation to excessive alcohol use and intoxication (Farb & Matjasko,

2012). In addition, some data suggests an association with higher rates of smoking and intoxication (United Nations Office on Drugs and Crime [UNODC] and World Health Organization [WHO], 2018). For example, Murray et al. (2021) found that participation in team sports is associated with an increased risk of alcohol use among boys and girls during adolescence. These associations can be attributed to specific sports, including football, volleyball, and field hockey. However, results suggest that these trends change in young adulthood, with participation in team sports in young adulthood being negatively associated with substance use (cigarettes and marijuana). Although the research findings are inconclusive, it is clear that leisure time can be an important factor in positive adolescent development, but it can also lead to risky behaviour and substance use. One cannot simply conclude that SLA per se leads to positive developmental outcomes and that unstructured leisure activities have no impact on developmental outcomes or lead to negative developmental outcomes in adolescents.

However, today it is popular to promote various SLA and frequent participation in them as beneficial to development without evidence of effectiveness. There is a need to present scientific data on the extent to which frequent participation in various types of SLA can prevent risky substance use, so that we can make informed decisions to prevent substance use among adolescents in a leisure context. There is also a need to examine how various structured leisure activities may contribute to the development of substance use. That is, there is a dearth of studies examining the contribution of SLA to the differential risk of substance use. The purpose of this article is to examine, from the perspective of adolescents, how socio-demographic characteristics, the frequency of adolescent participation in SLA, and the type of SLA may contribute to adolescent alcohol use, and, more specifically, to determine the extent to which socio-demographic characteristics, the frequency of adolescent participation in SLA, and the type of SLA contribute to adolescent alcohol use (lifetime prevalence, monthly prevalence, binge drinking – BD), and to examine the moderating effect of gender, age, and the type of SLA on the relationship between the frequency of adolescent participation in SLA and adolescent alcohol use (lifetime prevalence, monthly prevalence, BD).

2 METHODS

2.1 Participants and procedure

This cross-sectional research study was conducted from April to June 2021 as part of a research project that explored leisure time and risk behaviours in Croatia (*Quality of leisure time as a protective factor for the development of behavioural problems*). The study was designed to cover all groups of students in all the regular secondary schools in Krapinsko-Zagorska County, Croatia (consent to participate in the study). The total sample consisted of 2823 students from nine secondary schools, which represents 66.48% of the total number of students in Krapinsko-Zagorska County, Croatia. For the purposes of this study, only students who reported participating in SLA were included in the sample ($N = 1431$, 51%).

The students were asked to choose the SLA in which they participate (or in which they participated before the restrictions resulting from the COVID-19 pandemic), which is most important to them, and in which they participate for at least one hour per week. The collected data shows that most of the adolescents participate in team sports (e.g. football, handball, or volleyball; 36.6%) and individual sports (e.g. swimming or tennis; 23%). In addition, 21% of them are involved in musical arts activities (performing and fine arts), 3.3% in educational activities (e.g. learning foreign languages, IT), and 5% in community-oriented activities (e.g. scouts or the young volunteer firefighting department). The participants were between 14 and 21 years old ($M = 18.87$, $SD = 1.23$). 44.8% of the participants were female, while 2.4% of the participants did not want to provide gender information. In total, 20.7% of the students were enrolled in a two- or three-year professional education programme, 52.7% were enrolled in a four- or five-year professional education programme, and 26.6% were enrolled in a general education (university preparation) programme. The participants were also distributed approximately evenly among the first (29.8%), second (29.4%), and third years of study (22.9%), with fewer students in the fourth (16.4%) and fifth years (1.6%) because of the presence of two- and three-year school programmes in the sample. Regarding the financial situation of their families, 19.1% of the participants reported that the financial situation was average, while 60% of them described it as good. The socio-demographic characteristics of the participants who took part in SLA are shown in *Table 1*.

The study was conducted by completing an online questionnaire (45 minutes, Survey Monkey tool) in collaboration with the professionals at the schools. Ethical approval for the study was obtained from the Ministry of Science and Education and Ethical Committee at the Faculty of Education and Rehabilitation Sciences, University of Zagreb. All the study participants signed an informed consent form before completing the questionnaire. Written informed consent for participation was not provided by the participants' legal guardians/next of kin because, according to the Ethical Codex for Research with Children (Ajduković & Kolesarić, 2003), adolescents who are 14 years old can give their consent autonomously. Their consent was obtained online after the study objectives were explained to them and before the survey was conducted.

2.2 Measures

Questionnaire of Youth Leisure Time

The Questionnaire of Youth Leisure Time consists of 15 questions. The questionnaire included the following topics: the amount of leisure time young people have during the week and at weekends; the activities they typically spend their leisure time doing; the frequency of participation in SLA (a) from January 2019 to January 2020—before the COVID-19 pandemic and b) as a result of the COVID-19 pandemic restrictions—2020 and early 2021); the types of SLA in which young people participate; changes in patterns of participation in SLA as a result of the COVID-19 pandemic; payment for participation in SLA in which young people participate; inability to

Table 1 | Socio-demographic characteristics of participants (sample – students participating in SLA; N = 1431)

Krapinsko-Zagorska County									
Gender	n (%)	Age	n (%)	Grade	n (%)	Secondary school programme	n (%)	Family's financial situation	n (%)
Female	641 (44.8)	14	1 (0.1)	First grade	426 (29.8)	Two- or three-year vocational programme	296 (20.7)	Extremely bad	6 (0.4)
Male	756 (52.8)	15	88 (6.1)	Second grade	420 (29.4)	Four- or five-year vocational programme	754 (52.7)	Bad	19 (1.3)
Didn't declare their gender	34 (2.4)	16	425 (29.7)	Third grade	327 (22.9)	General education (university preparation) programme	381 (26.6)	Average	273 (19.1)
		17	399 (27.9)	Fourth grade	235 (16.4)			Good	858 (60.0)
		18	296 (20.7)	Fifth grade	23 (1.6)			Extremely good	275 (19.2)
		19	191 (13.3)						
		20	22 (1.5)						
		21	9 (0.6)						

participate in SLA as a result of the COVID-19 pandemic. In the analysis presented in this article, we included a question about their frequency of participation in SLA before the COVID-19 pandemic. The students estimated the frequency of their participation during the week (Monday to Friday) and at weekends (Saturday and Sunday). Finally, two continuous variables—the frequency of adolescents' participation before the COVID-19 pandemic (FAP BEFORE; $\alpha = 0.68$) and the frequency of adolescents' participation under the restrictions imposed because of the COVID-19 pandemic in 2020 and early 2021 (FAP DURING; $\alpha = 0.78$)—were created to indicate the frequency of the students' participation in SLA on a monthly basis (from 0 to 28 times). These two variables are moderately significantly positively correlated ($p < .05$; $r = 0.605$)

CTC Youth Survey

The CTC Youth Survey has been validated in previous studies conducted in Croatia (e.g. Mihić et al., 2011; Mihić et al., 2013). The questionnaire explores behaviours related to school and attitudes towards school, internet use, risky sexual behaviour, experiences of peer violence, abuse in relationships, gambling, and alcohol and drug use. In the present study, we focused on data on alcohol use. The alcohol use questions addressed early commencement of alcohol use, lifetime prevalence, monthly prevalence of alcohol use, and BD.

- early commencement of alcohol use (two items, e.g. “Please mark your age when you first had more than just a few sips of beer, wine, or hard liquor (e.g. vodka, whisky, or brandy)?”);

- lifetime prevalence of alcohol use (one item, i.e. “How many times IN YOUR LIFETIME have you drunk beer, wine, or hard liquor?”); The composite measure of lifetime alcohol use gives values from 1 to 5, where 1 is never and 5 is every day. The target variable, lifetime prevalence, is categorized as follows: low risk = never, one or two times; medium risk = one or two times a month, and high risk = one or two times a week and every day.
- monthly prevalence of alcohol use (one item, i.e. “How many times in THE PAST 30 DAYS have you drunk beer, wine, or hard liquor?”); The composite variable alcohol use in the past 30 days gives values from 1 to 5, where 1 is never and 5 is every day. The monthly prevalence of adolescent alcohol use is the outcome variable, distinguished as follows: low risk = never; medium risk = one or two times per month; and high risk = once or a few times a week and every day.
- BD (one item, i.e. “Look back at the past two weeks. On how many occasions have you had five or more drinks in a row over that period?”). The composite variable BD gives values from 1 to 6, where 1 is not even once and 6 is ten or more times.

The appropriate cut-off points to categorize the lifetime and monthly prevalence of adolescents' alcohol use are dependent on the substance studied (e.g. Ryan et al., 2019).

Table 2 | Multinomial logistic regression analyses with gender and FAP BEFORE in SLA as predictors and adolescents' lifetime prevalence of alcohol use as a criterion & Multinomial logistic regression analysis with age and FAP BEFORE in SLA as predictors and adolescents' lifetime prevalence of alcohol use as a criterion

Lifetime prevalence of adolescents' alcohol use			
	B (S.E.)	OR	CI
Low vs. high risk			
MALE	0.320 (0.210)	1.389	(0.921 – 2.096)
FEMALE	1.185** (0.243)	3.269	(2.032 – 5.259)
FAP BEFORE	-0.001 (0.020)	0.999	(0.960 – 1.039)
FAP BEFORE * MALE	0.017 (0.024)	1.017	(0.970 – 1.067)
FAP BEFORE * FEMALE	0 ^b		
Medium vs. high risk			
MALE	0.233 (0.220)	1.250	(0.813 – 1.923)
FEMALE	1.269** (0.243)	3.558	(2.212 – 5.724)
FAP BEFORE	-0.014 (0.029)	0.986	(0.947 – 1.026)
FAP BEFORE * MALE	0.014 (0.025)	1.014	(0.966 – 1.065)
FAP BEFORE * FEMALE	0 ^b		

Note: Reference category is high risk; CI = 95% confidence interval;

$R^2 = 0.13$ (Nagelkerke); Model $\chi^2(8) = 149.463$, $p < 0.001$;

* $p < .05$, ** $p < 0.01$; boldface odds ratios (OR) are significant at $p < .05$;

FREQUENCY OF ADOLESCENTS' PARTICIPATION (before the COVID-19 pandemic) = FAP BEFORE

0^b This parameter is set to zero because it is redundant

Lifetime prevalence of adolescents' alcohol use			
	B (S.E.)	OR	CI
Low vs. high risk			
AGE	-0.398** (0.122)	0.672	(0.529 – 0.853)
FAP BEFORE	-0.046 (0.039)	0.955	(0.884 – 1.031)
AGE * FAP BEFORE	0.010 (0.009)	1.010	(0.993 – 1.028)
Medium vs. high risk			
AGE	-0.162 (.119)	0.851	(0.673 – 1.075)
FAP BEFORE	-0.067 (.040)	0.935	(0.864 – 1.012)
AGE * FAP BEFORE	-0.011 (.009)	1.011	(0.993 – 1.029)

Note: Reference category is high risk; CI = 95% confidence interval;

$R^2 = 0.03$ (Nagelkerke); Model $\chi^2(6) = 35.687$, $p < 0.001$;

* $p < .05$, ** $p < 0.01$; boldface odds ratios (OR) are significant at $p < .05$;

FREQUENCY OF ADOLESCENTS' PARTICIPATION (before the COVID-19 pandemic) = FAP BEFORE

2.3 Data analysis

All the statistical analyses were performed with SPSS 21.0 (IBM, Armonk, NY, USA). Descriptive statistics were used to determine sample characteristics, including frequencies and percentages.

Because the study was conducted during the COVID-19 pandemic, we asked adolescents about their frequency of participation in SLA, before the COVID-19 pandemic and as a result of the COVID-19 pandemic restrictions in 2020 and early

2021. We attempted to include both frequency of participation variables in the data analysis to examine their contribution to lifetime prevalence, the monthly prevalence of alcohol use, and BD, and there were no differences in the results. Therefore, in this study, we chose to apply the model logic described below, which is the most methodologically appropriate. In our data analysis, we included the variable FAP BEFORE when we examined its contribution to the lifetime prevalence of adolescent alcohol use. However, we included the variable FAP DURING and examined its contribution to the monthly prevalence of

adolescent alcohol use and BD because we asked the adolescents about their recent alcohol use experiences.

To achieve the aim of this article, two types of analyses were performed. (1) Multinomial logistic regression analyses were used to examine the association between gender, types of SLA, and frequency of adolescent participation in SLA (FAP BEFORE/FAP DURING), as predictors and the lifetime and monthly prevalence of adolescent alcohol use as criteria. The same analyses were also used to examine the moderating effect of gender and types of SLA on the relationship between the frequency of adolescent participation in SLA (FAP BEFORE/FAP DURING), and the lifetime and monthly prevalence of adolescent alcohol use. (2) Finally, Poisson regression was used to examine the association between gender, age, types of SLA, FAP DURING, and adolescent BD. In addition, the moderating effect of gender, age, and types of SLA on the association between FAP DURING and adolescent BD was examined.

3 RESULTS

The data suggests a high level of prevalence of alcohol use among those adolescents participating in SLA. That is, 84% of the adolescents participating in SLA have used alcohol in their lifetime. In terms of lifetime prevalence, 36% of the adolescents belong to the medium-risk group, while 19.8% of them belong to the high-risk group. Regarding the monthly prevalence of alcohol consumption, 39% of the participants belonged to the medium-risk group and 27% to the high-risk group. In total, 40.3% of the adolescents had had at least one BD experience or more, i.e. the consumption of five or more alcoholic drinks in a row, in the past two weeks. In addition, 23.2% of the adolescents who participated in SLA had had two or more experiences of consuming five or more alcoholic drinks in a row in the past two weeks.

3.1 Lifetime prevalence of alcohol use among adolescents

Multinomial logistic regression was performed to model the relationship between the predictor variables (gender, age, types of SLA, and frequency of adolescent participation in SLA) and the criterion variable (lifetime prevalence of adolescent alcohol use). In addition, the moderating effect of gender, age, and types of SLA on the relationship between the frequency of adolescent participation in SLA and lifetime prevalence of adolescent alcohol use was examined.

The first model examined the association between gender, FAP BEFORE, and lifetime prevalence of adolescent alcohol use; the full model was significantly reliable ($N = 1397$; $\chi^2(4) = 149.463$; $p < .000$; *Table 2*). Those participants who did not want to provide gender information were excluded from the model ($n = 34$). Gender was independently associated with the lifetime prevalence of adolescent alcohol use ($\chi^2(4) = 36.71$). The female adolescents were 3.27 times more likely to be in the low-risk group (i.e. those who use alcohol less frequently in their lifetime) and 3.56 times more likely to be in the medium-risk

group (those who use alcohol moderately in their lifetime) than in the high-risk group (those who use alcohol heavily in their lifetime), compared with the male adolescents. From the model, it appears that there is no association between the frequency of adolescent participation in SLA and the lifetime prevalence of adolescent alcohol use. In addition, gender has no moderating effect on the relationship between FAP BEFORE and the lifetime prevalence of adolescent alcohol use.

Second, the association between age, FAP BEFORE, and the lifetime prevalence of alcohol use in the adolescents was examined. The full model was significantly reliable ($N = 1431$; $\chi^2(6) = 35.687$; $p < .000$; *Table 2*). Age ($\chi^2(2) = 12.084$) was independently associated with the lifetime prevalence of adolescent alcohol use. Compared with the younger adolescents, the older adolescents were 0.67 times less likely to be in the low-risk group than in the high-risk group for lifetime alcohol use. From the model, it appears that there is no association between the frequency of adolescent participation in SLA and the lifetime prevalence of adolescent alcohol use. In addition, age has no moderating effect on the relationship between FAP BEFORE and the lifetime prevalence of adolescent alcohol use.

In addition, the association between types of SLA, FAP BEFORE in SLA, and the lifetime prevalence of alcohol use among the adolescents was examined; the full model was significantly reliable ($N = 1431$; $\chi^2(20) = 147.274$; $p < .000$; *Table 3*). The type of SLA was independently associated with the lifetime prevalence of adolescent alcohol use ($\chi^2(10) = 37.141$). Adolescents who participated in individual sports activities were 3.31 times more likely and those involved in performance and fine arts activities were 2.51 times more likely to be in the low-risk group of adolescents than in the group of adolescents with high lifetime alcohol use. In addition, adolescents who participated in group sports activities were 1.80 times, those involved in individual sports activities 3.53 times, and those involved in performance and fine arts activities 2.16 times more likely to be in the medium-risk group than in the high-risk group. From the model, there is no relationship between the frequency of adolescent participation in SLA and the lifetime prevalence of adolescent alcohol use. In addition, the model shows that there is no moderating effect of the types of SLA on the relationship between FAP BEFORE and the lifetime prevalence of adolescent alcohol use.

3.2 Monthly prevalence of alcohol use among adolescents

Multinomial logistic regression was performed to model the relationship between the predictor variables (gender, age, types of SLA, and the frequency of adolescent participation in SLA) and the criterion variable (monthly prevalence of adolescent alcohol use). In addition, the moderating effect of gender, age, and types of SLA on the relationship between the frequency of adolescent participation in SLA and the monthly prevalence of adolescent alcohol use was examined.

With regard to the monthly prevalence of adolescent alcohol use, the contribution of gender and FAP DURING and the moderating effect of gender and FAP DURING were examined.

Table 3 | Multinomial logistic regression analyses with types of SLA and FAP BEFORE in SLA as predictors and adolescents' lifetime prevalence of alcohol use as a criterion

Lifetime prevalence of adolescents' alcohol use			
	B (S.E.)	OR	CI
Low vs. high risk			
Sports – team	0.257 (0.256)	1.293	(0.783 – 2.137)
Sports – individual	1.119** (0.347)	3.318	(1.679 – 6.555)
Performance and fine arts (Musical, Performance, Art clubs)	0.922** (0.298)	2.513	(1.400 – 4.511)
Educational	0.558 (0.604)	1.748	(0.535 – 5.712)
Community-oriented	0 ^b		
FAP BEFORE	0.011 (0.062)	1.011	(0.895 – 1.142)
FAP BEFORE * Sports – team	0.006 (0.064)	1.006	(0.887 – 1.140)
FAP BEFORE * Sports – individual	-0.016 (0.066)	0.984	(0.864 – 1.121)
FAP BEFORE * Performance and fine arts (Musical, Performance, Art clubs)	-0.014 (0.067)	0.987	(0.865 – 1.125)
FAP BEFORE * Educational	0.122 (0.119)	1.130	(0.894 – 1.428)
FAP BEFORE * Community-oriented	0 ^b		
Medium vs. high risk			
Sports – team	0.590** (0.253)	1.804	(1.098 – 2.964)
Sports – individual	1.263** (0.353)	3.537	(1.771 – 7.063)
Performance and fine arts (Musical, Performance, Art clubs)	0.770** (0.308)	2.161	(1.182 – 3.951)
Educational	-0.087 (0.666)	0.917	(0.248 – 3.385)
Community-oriented	0 ^b		
FAP BEFORE	0.042 (0.061)	1.042	(0.925 – 1.175)
FAP BEFORE * Sports – team	-0.061 (0.063)	0.941	(0.831 – 1.064)
FAP BEFORE * Sports – individual	-0.068 (0.066)	0.934	(0.821 – 1.062)
FAP BEFORE * Performance and fine arts (Musical, Performance, Art clubs)	-0.051 (0.067)	0.950	(0.834 – 1.082)
FAP BEFORE * Educational	0.106 (0.122)	1.112	(0.876 – 1.142)
FAP BEFORE * Community-oriented	0 ^b		

Note: Reference category is high risk; CI = 95% confidence interval; $R^2 = 0.12$ (Nagelkerke); Model $\chi^2(20) = 147.274$, $p < 0.001$;

* $p < .05$, ** $p < 0.01$; boldface odds ratios (OR) are significant at $p < .05$;

FREQUENCY OF ADOLESCENTS' PARTICIPATION (before the COVID-19 pandemic) = FAP BEFORE

0^b This parameter is set to zero because it is redundant

The full model was significantly reliable ($N = 1397$; $\chi^2(8) = 50.746$; $p < .000$; Table 4). Those participants who did not want to provide gender information were excluded from the model ($n = 34$). Gender ($\chi^2(4) = 19.03$) was independently associated with the monthly prevalence of adolescent alcohol use. The female adolescents were 1.73 times more likely to be in the medium-risk group than in the group of adolescents who consumed alcohol heavily on a monthly basis (those in the high-risk group), compared with the male adolescents. From the model, it appears that there is no relationship between the frequency of adolescent participation in SLA and the monthly prevalence of adolescent alcohol use. In addition, the model shows that there is no moderating effect of gender on the rela-

tionship between FAP DURING and the monthly prevalence of adolescent alcohol use.

Thus, the next model examined the relationship between age, FAP DURING in SLA, and the monthly prevalence of alcohol consumption in the adolescents. It also examined the moderating effect of age and FAP DURING on the monthly prevalence of adolescent alcohol use. The full model was not significantly reliable ($N = 1431$; $\chi^2(6) = 9.481$; $p > .05$).

In addition, the association between the types of SLA, FAP DURING in SLA, and the monthly prevalence of alcohol use among the adolescents was examined. The moderating effect

Table 4 | Multinomial logistic regression analyses with gender, FAP DURING in SLA, and the moderating effect of gender and FAP due to COVID-19 in SLA as predictors and adolescents' monthly prevalence of alcohol use as a criterion

Monthly prevalence of adolescents' alcohol use			
	B (S.E.)	OR	CI
Low vs. high risk			
MALE	0.048 (0.157)	1.049	(0.771 – 1.429)
FEMALE	0.148 (0.149)	1.160	(0.867 – 1.552)
FAP DURING	0.037 (0.021)	1.037	(0.995 – 1.081)
FAP DURING* MALE	-0.031 (0.024)	0.970	(0.925 – 1.017)
FAP DURING* FEMALE	0 ^b		
Medium vs. high risk			
MALE	0.054 (0.157)	1.056	(0.776 – 1.437)
FEMALE	0.550** (0.137)	1.733	(1.323 – 2.268)
FAP DURING	0.034 (0.020)	1.035	(0.995 – 1.076)
FAP DURING* MALE	-0.029 (0.023)	0.971	(0.927 – 1.017)
FAP DURING* FEMALE	0 ^b		

Note: Reference category is high risk; CI = 95% confidence interval;

$R^2 = 0.05$ (Nagelkerke); Model $\chi^2(8) = 50.746$, $p < 0.001$;

* $p < .05$ ** $p < 0.01$; boldface odds ratios (OR) are significant at $p < .05$;

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0^b This parameter is set to zero because it is redundant

of the types of SLA and FAP DURING on the monthly prevalence of adolescent alcohol use was examined. The full model was significantly reliable ($N = 1431$; $\chi^2(20) = 60.500$; $p < .000$; Table 5). The type of SLA was independently associated with the monthly prevalence of adolescent alcohol use ($\chi^2(10) = 43.541$). In addition, the moderating effect of types of SLA and FAP due to COVID-19 was independently associated with the monthly prevalence of adolescent alcohol use ($\chi^2(8) = 18.473$). Those adolescents who participated in individual sports activities were 1.70 times more likely to be in the low-risk group and 1.76 times more likely to be in the medium-risk group than the high monthly alcohol consumption group. From the model, the types of SLA have a moderating effect on the relationship between FAP due to COVID-19 in SLA and the monthly prevalence of adolescent alcohol use. Those adolescents who participated more frequently in performance and fine arts and educational activities during the COVID-19 pandemic were more likely to be in the medium-risk group than the high-risk group (see Figure 1). In addition, Figure 1 shows that the interaction of FAP due to COVID-19 with the reference line (community-oriented activities) is significantly different from the lines of performance and fine arts activities and educational activities. Those adolescents who were more likely to participate in community-oriented activities during the COVID-19 pandemic were also more likely to be in the high-risk group for monthly alcohol use. Accordingly, participation in performance and fine arts and educational activities acts as a protective factor and reduces the likelihood of a high monthly prevalence of alcohol use, whereas participation in community-oriented activities acts

as a risk factor and increases the likelihood of a high monthly prevalence of alcohol use.

3.3 Adolescents' binge drinking (BD) behaviour

Poisson regression was used to examine the relationship between age, gender, types of SLA, and the frequency of adolescent participation in SLA as predictors and adolescent BD as a criterion. In addition, the moderating effect of gender, age, and types of SLA on the relationship between the frequency of adolescent participation in SLA and adolescent BD was examined.

In the first model, the relationship between gender, FAP DURING, and adolescent BD behaviour was examined. In addition, the moderating effect of types of SLA on the relationship between FAP DURING and adolescent BD was examined. Those participants who refused to provide gender information were excluded from the model ($n = 34$). Together, the predictors explained a significant proportion of the variance in the outcome ($N = 1397$; $\chi^2(3) = 7.552$; $p < .005$; Table 6). The results of the count model showed that gender ($\chi^2(1) = 4.980$) had a significant main effect on the adolescents' BD behaviour. The model shows that the male adolescents had a 1.15 higher risk of BD behaviour compared with the female adolescents. From the model, there is no association between FAP DURING and the adolescents' BD. In addition, gender has no moderating effect on the relationship between FAP DURING and adolescent BD behaviour.

Table 5 | Multinomial logistic regression analyses with types of SLA, FAP DURING in SLA, and the moderating effect of types of SLA and FAP DURING in SLA as predictors and adolescents' monthly prevalence of alcohol use as a criterion

Monthly prevalence of adolescents' alcohol use			
	B (S.E.)	OR	CI
Low vs. high risk			
Sports – team	-0.318 (0.184)	0.728	(0.507 – 1.044)
Sports – individual	0.530* (0.219)	1.699	(1.106 – 2.609)
Performance and fine arts (Musical, Performance, Art clubs)	0.129 (0.185)	1.138	(0.791 – 1.637)
Educational	0.825 (0.550)	2.282	(0.777 – 6.703)
Community-oriented	0 ^b		
FAP DURING	-0.116 (0.091)	0.890	(0.745 – 1.063)
FAP DURING * Sports – team	0.145 (0.092)	1.156	(0.966 – 1.385)
FAP DURING * Sports – individual	0.106 (0.093)	1.112	(0.927 – 1.334)
FAP DURING * Performance and fine arts	0.129 (0.094)	1.138	(0.947 – 1.368)
FAP DURING * Educational	0.098 (0.127)	1.103	(0.860 – 1.414)
FAP DURING * Community-oriented	0 ^b		
Medium vs. high risk			
Sports – team	0.248 (0.166)	1.281	(0.925 – 1.775)
Sports – individual	0.564** (0.216)	1.758	(1.150 – 2.685)
Performance and fine arts (Musical, Performance, Art clubs)	0.146 (0.183)	1.157	(0.808 – 1.656)
Educational	-0.172 (0.625)	0.842	(0.247 – 2.866)
Community oriented	0 ^b		
FAP DURING	-0.146 (0.083)	0.864	(0.734 – 1.016)
FAP DURING * Sports – team	0.136 (0.084)	1.146	(0.972 – 1.351)
FAP DURING * Sports – individual	0.145 (0.085)	1.156	(0.979 – 1.365)
FAP DURING * Performance and fine arts	0.180* (0.086)	1.197	(1.011 – 1.416)
FAP DURING * Educational	0.269* (0.023)	1.308	(1.037 – 1.650)
FAP DURING * Community-oriented	0 ^b		

Note: Reference category is high risk; CI = 95% confidence interval;

$R^2 = 0.06$ (Nagelkerke); Model $\chi^2(20) = 60.500, p < 0.001$;

* $p < .05$, ** $p < 0.01$; boldface odds ratios (OR) are significant at $p < .05$;

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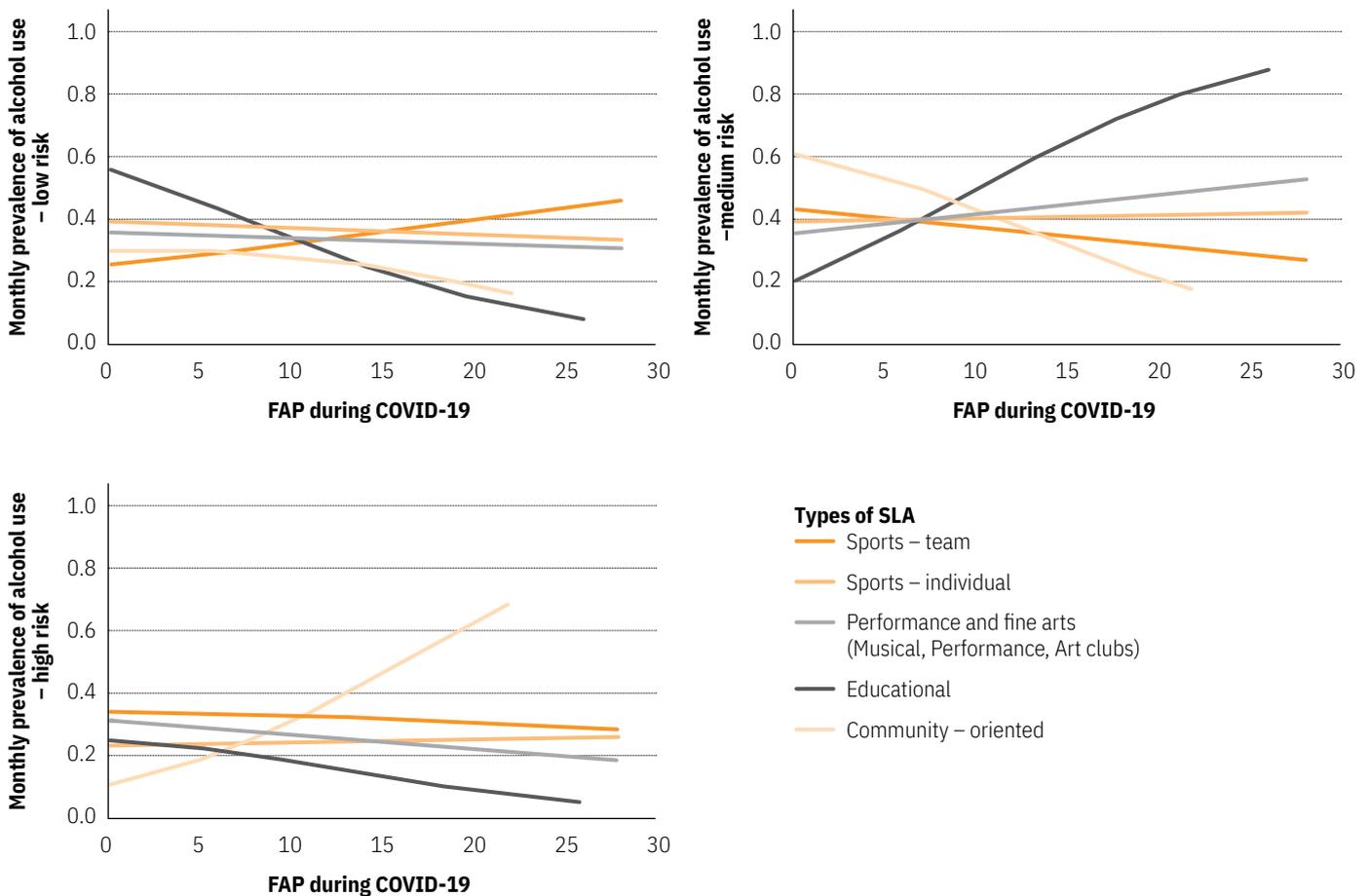
0^b This parameter is set to zero because it is redundant

The next model examined the relationship between age, FAP DURING in SLA, and adolescent BD behaviour. It also examined the moderating effect of age and FAP DURING on adolescent BD behaviour. The full model was not significantly reliable ($N = 1431$; $\chi^2(3) = 6.758; p > .05$).

The relationship between the types of SLA, FAP DURING in SLA, and adolescent BD behaviour was examined. The moderating effect of the types of SLA and FAP DURING on adolescent BD behaviour was also examined. Together, the predictors explained a significant proportion of the variance in the outcome ($N = 1431$; $\chi^2(10) = 697.844; p < .005$; Table 7). The results of the count model showed that the types of SLA

($\chi^2(5) = 394.876$) had a significant main effect on the adolescents' BD behaviour. Group sports, individual sports, performance and fine arts, and educational activities were positively associated with adolescent BD behaviour. Thus, regardless of the type of SLA in which they participate, the adolescents engage in BD. However, a moderating effect of the types of SLA (sports, team, and educational activities) on the relationship between the frequency of adolescent participation in SLA and the monthly prevalence of alcohol use among the adolescents was found. The moderating effect indicates that participation in group sports and educational activities moderates the relationship between the frequency of adolescent participation in SLA and adolescent BD behaviour. That is, those adolescents who

Figure 1 | Plots of the moderating effect of types of SLA and FAP DURING in SLA as predictors and adolescents' monthly prevalence of alcohol use as a criterion



participated more frequently in group sports activities during the COVID-19 pandemic, and particularly those who participated more frequently in educational activities during the COVID-19 pandemic, were less likely to display BD behaviours (Figure 2). In addition, Figure 2 shows that the interaction of FAP due to COVID-19 with the reference line (community-oriented activities) is significantly different from the lines of educational and group sports activities. Those adolescents who were more likely to participate in community-oriented activities during the COVID-19 pandemic were also more likely to indulge in BD. Accordingly, participation in educational and group sports activities acts as a protective factor and reduces the likelihood of BD, whereas participation in community-oriented activities acts as a risk factor and increases the likelihood of BD.

4 DISCUSSION

In this study, the results showed that gender has an influence on adolescent alcohol consumption (monthly prevalence, lifetime prevalence, and BD). The female adolescents were less likely to consume alcohol on a monthly and lifetime basis compared with the male adolescents. In addition, the female adolescents were less likely than the male adolescents to engage in BD behaviours. These findings are consistent with the data on the prevalence of alcohol use at the Croatian and European

levels (Capak, 2020; ESPAD Group, 2020; Inchley et al., 2020; PrevLab, ERF UNIZG, 2019). In addition, the results of this study confirmed that older adolescents consume more alcohol over their lifetime compared to younger adolescents, and this finding is also consistent with those of previous studies (Capak, 2020; Inchley et al., 2020; PrevLab, ERF UNIZG, 2019).

The frequency of adolescent participation in SLA did not contribute to adolescent alcohol use (monthly prevalence, lifetime prevalence, and BD). This finding is consistent with the findings of Darling (2005), whose study also showed that more time spent on extracurricular activities was not associated with substance use. In general, the evidence on the association between the frequency of participation in SLA and adolescent alcohol use is conflicting. According to the Vermont Department of Health (2015), students who participate in weekly extracurricular activities are significantly less likely to use alcohol, tobacco, or marijuana than students who do not participate in any such activities. However, alcohol use (any use and BD) is significantly higher among students who participate in activities for 20 hours or more compared to all other levels of participation in activity, including no activity.

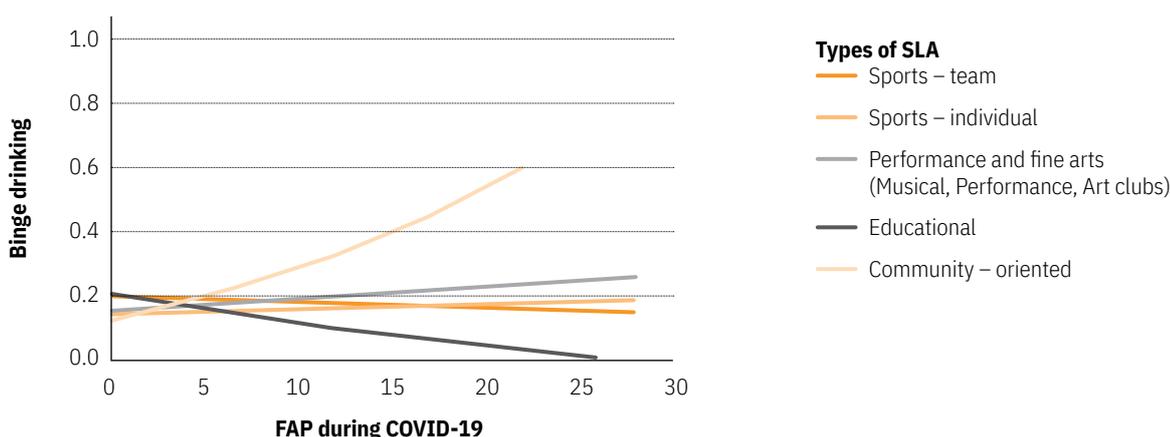
According to the type of SLA, participation in group sports, individual sports, and performance and fine arts activities contributed to lower lifetime alcohol consumption. Participation in

Table 6 | Poisson regression analyses with gender, FAP DURING in SLA, and the moderating effect of gender and FAP DURING in SLA as predictors and adolescents' BD behaviour as a criterion

Adolescents' binge drinking (BD)				
	B (S.E.)	Wald χ^2	OR	CI
MALE	0.138* (0.061)	4.980	1.148	(0.017 – 0.259)
FEMALE	0 ^b			
FAP DURING	7.302 (0.005)	0.000	1.000	(-0.011 – 0.011)
FAP DURING * MALE	-0.002 (0.006)	0.115	0.998	(-0.015 – 0.011)
FAP DURING * FEMALE	0 ^b			

Note: CI = 95% confidence interval; Model $\chi^2(3) = 7.552, p < 0.01$; * $p < .05$, ** $p < 0.01$; boldface odds ratios (OR) are significant at $p < .05$; FREQUENCY OF ADOLESCENTS' PARTICIPATION because of the restrictions imposed because of the COVID-19 pandemic in 2020 and early 2021 = FAP DURING
0^b This parameter is set to zero because it is redundant

Figure 2 | Plots of the moderating effect of types of SLA and FAP DURING in SLA as predictors and adolescents' BD behaviour as a criterion



individual sports contributed to lower monthly alcohol use. In addition, participation in group sports, individual sports, performance/fine arts, and educational activities contributed to lower engagement in BD behaviours. It can be concluded that the type of SLA in which adolescents participate has an influence on the pathway of substance use. These findings are consistent with previous studies showing that young people who participate in SLA are less likely to use substances (Farb & Matjasko, 2012; Mahoney et al., 2010).

The results of this study show that gender and age have no moderating effect on the relationship between FAP DURING and adolescent alcohol use (lifetime prevalence, monthly prevalence, and BD). However, the results confirmed the moderating effect of the type of SLA on the relationship between FAP DURING and adolescent alcohol use (monthly prevalence and BD). Those adolescents who participated more frequently in performance/fine arts and educational activities during the COVID-19 pandemic were more likely to be in the medium-risk group than the high-risk group for monthly alcohol use. The adolescents who participated more frequently in group sports

activities during the COVID-19 pandemic, and especially those who participated more frequently in educational activities during the COVID-19 pandemic, were less likely to engage in BD behaviours. However, the adolescents who participated more frequently in community-oriented activities during the COVID-19 pandemic were more likely to be in the high-risk group for monthly alcohol use and more likely to engage in BD behaviours. Accordingly, participation in group sports, performance/fine arts, and educational activities acts as a protective factor and reduces the likelihood of risky alcohol use, whereas participation in community-oriented activities acts as a risk factor and increases the likelihood of risky alcohol use.

Limitations

The limitations of the study are primarily related to the fact that the study was conducted in the spring of 2021, during the time of the COVID-19 pandemic. During this time, many leisure activities were resumed and/or alternative ways of maintaining them were found. With this in mind, the participants were

Table 7 | Poisson regression analyses with types of SLA, FAP DURING in SLA, and the moderating effect of types of SLA and FAP DURING in SLA as predictors and adolescents' BD behaviour as a criterion

	Adolescents' binge drinking (BD)			
	B (S.E.)	Wald χ^2	OR	CI
Sports – team	0.682** (0.050)	182.483	1.978	(0.583 – 0.781)
Sports – individual	0.538** (0.062)	74.225	1.712	(0.415 – 0.660)
Performance and fine arts (Musical, Performance, Art clubs)	0.548** (0.055)	98.649	1.730	(0.440 – 0.656)
Educational	0.706** (0.152)	21.479	2.026	(0.407 – 1.005)
Community-oriented	0 ^b			
FAP DURING	0.041 (0.020)	3.884	1.042	(0.000 – 0.081)
FAP DURING * Sports – team	-0.045* (0.021)	4.587	0.956	(-0.086 – -0.004)
FAP DURING * Sports – individual	-0.036 (0.021)	2.888	0.964	(-0.078 – 0.006)
FAP DURING * Performance and fine arts	-0.030 (0.021)	1.978	0.970	(-0.073 – 0.012)
FAP DURING * Educational	-0.066* (0.029)	5.044	0.936	(-0.124 – -0.008)
FAP DURING * Community-oriented	0 ^b			

Note: CI = 95% confidence interval; Model $\chi^2(10) = 697.844, p < 0.01$; * $p < .05$, ** $p < 0.01$; boldface odds ratios (OR) are significant at $p < .05$;

FREQUENCY OF ADOLESCENTS' PARTICIPATION because of the restrictions imposed because of the COVID-19 pandemic in 2020 and early 2021 = FAP DURING

0^b This parameter is set to zero because it is redundant

asked about the time before the COVID-19 pandemic and the time of restrictions resulting from the COVID-19 pandemic. The accuracy and precision of the study participants' responses could be affected by answering questions about the time before the COVID-19 pandemic.

It was planned to conduct the survey among all the secondary school students in Krapinsko-Zagorska County, Croatia. In the end, 66.48% of the students participated in the survey. A total of 33.52% of them were not included because they were not present in class during the survey or refused to participate in the study, and some of them already ceased to participate at the beginning of the survey. Ultimately, the results cannot be generalized to the national level. However, a large sample was recruited for the study so that the proposed model could be tested.

Furthermore, when self-report data is collected in groups, there is also the possibility that the responses are biased as a result of social pressure and the need for participants to provide socially desirable answers. This risk was addressed by guided data collection in which the researcher provided clear instructions and took care to maintain the confidentiality of the data. At the same time, the fact that the questionnaire was completed online ensured the anonymity and confidentiality of the research. Since the data is entered directly into the database and cannot be linked to the participants, this provides greater anonymity. There are some limitations connected with conducting online surveys, but these were largely addressed by the way the group surveys were organized; participants could only access the questionnaire once; participants were not asked to provide

personal information; participants could return to the previous question and change previously provided information at any time during the completion of the questionnaire, and at the end of the survey, participants were provided with the research team's contact information so that they could contact them if they had further questions about the survey or were upset by completing the survey.

5 CONCLUSION

The leisure context gives us space, time, and freedom to be who we really are. And adolescence is a time of exploration, experimentation, and identification to find out who we really are. Experimentation is part of the natural process during this time, which often includes experimenting with substance use. However, this can be risky and lead to negative developmental outcomes for adolescents. It should be noted that participation in some SLA can be beneficial for adolescents and can help them develop into healthy adults by engaging in activities and practising behaviours that contribute to personal enjoyment, meaning, and the development of identity and autonomy.

Participation in SLA after school and/or at weekends is important and contributes to young people's development. However, participation in some other types of leisure activities that are not necessarily supervised or structured is also important, especially when SLA is not available to young people (Caldwell, 2017). It is not sufficient to associate only the type of activity with outcomes, i.e. mere participation in an SLA is not the only factor explaining the association with the developmental outcomes for young people (Badura, 2018). Although this data suggests that certain SLA may be considered protective factors for risky alcohol use, it is necessary to consider a preventive effect. Therefore, future research should also focus on motivation, experiences, and the context of leisure (Belošević & Ferić, 2022; UNODC & WHO, 2018).

Authors' contributions: MB and MF contributed to the conceptualization and design of the study. MB participated in the data collection and data analysis and drafted the manuscript. MF critically revised the manuscript and contributed to the discussion and conclusion section. Both authors reviewed and edited the manuscript. Both authors read and approved the final manuscript.

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