

# LEISURE TIME ACTIVITIES, PERCEIVED RISKS OF DRINKING AND SELECTED SOCIO-DEMOGRAPHIC VARIABLES AS PREDICTORS OF UNIVERSITY STUDENTS' ALCOHOL USE

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## **Abstract**

*Research question.* Assuming if we control for the possible effect of students' gender, age, and employment, are leisure time activities and perceived risks of alcohol use still able to predict a significant amount of the variances in students' alcohol use? *Methods.* 1087 students from Lithuanian universities were selected through random sampling to complete the questionnaire on alcohol use, leisure time activities, and perceived risks of drinking. *Results.* Regression analyses found significant effects of age, gender, employment, some leisure time activities on university students' alcohol use: frequency of drinking and intoxication, drunkenness last day they had drunk alcohol. In this model, the perceived risks of alcohol use were not significantly associated with alcohol use. *Conclusions.* Leisure time activities may offer both risk and protective effects for university students. Such leisure time activities as active participation in sports, athletics or exercising, reading of books for enjoyment, various hobbies, decreased going out in the evening to a disco, café, party, etc., and decreased socializing with friends in shopping centers, streets, parks, etc. just for fun can protect university students from frequent and heavy alcohol use.

**Keywords:** *Alcohol use, leisure time, drinking risks, university students.*

## **Introduction**

The consumption of alcohol has risen among young people during the past years in Europe (Steketee, Jonkman, Berten, & Vettenburg, 2013). In the UK, drinking among young people has already been highlighted in political rhetoric, academic research and popular media coverage (Townsheld, 2013). It has been argued that alcohol consumption currently has the greatest risks to the health of US college and university students (Hingson, Heeren, Winter, & Wechsler, 2005; Dowdall, 2008). In Lithuania, alcohol consumption per person is one

of the biggest among all EU countries (EUROSTAT, see online access), and this number is currently increasing (Statistics of Lithuania, see online access). Research studies on alcohol use among university and applied science university students in Lithuania show that the number is not significantly decreasing, since the following percentage of students reported that they consumed alcohol during the last 12 months: 84.7 % in 2005–2006, 78 % in 2011, 92.4 % in 2013 (Goštautas, Povilaitis, Pilkauskienė, Jakušvaitė, & Statkevičienė, 2007, 2009; Narkauskaitė, Juozulynas, Jurgelėnas, & Venalis, 2011; Dobrovolskij & Stukas, 2014). The mentioned facts indicate that the problem is still not being adequately addressed by current prevention and intervention efforts in Lithuania and other countries.

Many research works show that drinking has been associated with problems in students' emotional and mental well-being (Cornah, 2006), risky behaviors (Hingson, Heeren, Zakocs, Kopstein, & Wechsler, 2002), decline in academic performance (Balsa, Guiliano, & French, 2011), relationships between local community and campus, unemployment (Bajorūnienė et al., 2011), suicide and death (Petronytė, Zaborskis, & Veryga, 2007), sexual assault (Rutledge, Park, & Sher, 2008; Wechsler & Nelson, 2008), and others. These and other facts indicate both scale and urgency of the problem and encourage scientists to look for more effective strategies to solve the problem.

A wealth of research has explored predictors of university and college students' alcohol use, such as moderate gambling (Stea, Hodgins, & Lambert, 2011); influence of TV-shows (Thomsen & Rekve, 2006), alcohol advertising (Morgenstern, Isensee, Sargent, Hanewinkel, & 2011), place and drinking time (Johnston, O'Malley, Bachman, & Schulenberg, 2005; Neighbor et al., 2007; Buettner, Khurana, & Slesnick 2011), alcohol use among student's parents (Reimuller, Hussong, & Ennett, 2011), and others.

The above mentioned and other research studies suggest various associations regarding university students' alcohol use and related features, including \*gender, \*age, \*employment, \*perceived risks of alcohol use and such leisure time activities as \*active participation in sports, athletics or exercising, \*reading of books for enjoyment, \*going out in the evening to a disco, café, party etc., \*hobbies, \*socialising with friends in shopping centers, streets, parks, etc. just for fun, \*playing the computer games, \*using the Internet for leisure activities (chats, music, games, social networks, videos, etc.), \*gambling.

Literature on association between gender and alcohol use shows that male students tend to drink more than female ones (Foster et al., 2014, Goštautas, Povilaitis, Pilkauskienė, Jakušvaitė, & Statkevičienė, 2007, 2009; Wicki, Kuntsche, & Gmel 2010), and the alcohol consumed by male students is usually stronger (Bewick et al., 2008) as it is shown in the theoretical research on students' alcohol use in Europe in Wicki et al. (2010). Other research cases show that female students usually drink because of their immaturity (Fischer et al., 2007), whereas male more than female students tend to drink in order to cope (Park, Levenson, 2002). The prevalence of alcohol use associated with at least one or more of the five types of harm were higher in men than in women. In female and male students, the most common harm category was 'loss of control, acute consequences, and withdrawal', followed by 'negative influence on daily activities' (Bich Diep, Knibbe, Bao Giang, & De Vries, 2013).

Research on association between age and alcohol use indicates that the most common alcohol consumers are the middle aged, above 45 (Lifestyle Statistics, Health and Social Care Information Centre, 2013). However, this average age for alcohol consumption is getting younger over the past years (Johnston, O'Malley, Bachman, & Schulenberg, 2008). Other research works show that college student drink more than other age groups. The research

carried out at the end of the twentieth century (in 1999) indicated that surveyed full-time 2- and 4-year college students had consumed 5 or more drinks on a single occasion at least once in the previous 2 weeks, a greater proportion than found among same-age non-college peers and high school seniors (Hingson, Heeren, Winter, & Wechsler, 2005). Those attending 2-year institutions are representative of more at-risk populations (VanKim, Laska, Ehlinger, Lust, & Story 2010). Another research indicated that younger students were less likely to have a drink at some specific events; however, if they did they consumed more alcohol. Based on the above sources, hypothetically it is possible to assume that younger students consume less alcohol than older students, but, as some research cases show, they do it in higher quantities (Lewis et al., 2011); still, more evidence should be collected on this issue.

Employment as such may be the predictor of alcohol use (Wicki et al, 2010); however, only few research studies examined this relation, and no definite conclusion could be drawn. Literature analysis in Wicki' et al. (2010) demonstrates that employment as such may be associated with a less amount free time (i.e. less time to party and consume alcohol). As a result, a workplace may be an appropriate venue for alcohol prevention (Wu, Schlenger, & Galvin, 2003). On the other hand, having a job means more disposable income (i.e. lowering the subjective cost of alcohol) (Wicki et al, 2010); also, more stressful situations, workload, and others (Butler, Dodge, & Faurote, 2010) are observed. Butler, Dodge, and Faurote (2010) have found that working college students, despite their greater maturity and more autonomous living arrangements, consume alcohol more than others. Pendorf (1992) also suggested that heavy alcohol users among high school students from higher grades were job seekers and part-time workers more often than light users. However, research works in Lithuania show that employed youth are drinking less than unemployed (Bajorūnienė et al., 2011).

In their meta-analysis of research on protection motivation theory, Floyd, Prentice Dunn, and Rogers (2000, as cited in Chen & Yang, 2015) demonstrated that increase in perceived severity and vulnerability (two components of risk perception) were predictive of higher intention to take protective actions, and the effect was moderate. As a result, the perceived awareness may affect alcohol consumption among youth (Wetherill & Fromme, 2007). Yeomans-Maldonado and Patrick (2015) indicate that alcohol use among young adults is associated with a lower perceived risk of using alcohol. However, Dantzer et al. (2006, as cited in Wicki et al., 2010) suggested that a lack of knowledge about the specific long-term consequences of alcohol consumption could not be a determinant of heavy drinking among university students. Moreover, perceptions of drinking risk are less important to the explanation of alcohol involvement than normative beliefs about the drinking practices of one's closest friends, as indicated by Lewis and Thombs (2005).

Some research studies show a link between computer games and alcohol consumption. Students who tend to play computer games drink more alcohol than those who are not (Frangos, Frangos, & Sotiropoulos, 2011). Another research case with the youth indicated that early drinking before the age of 13 is also significantly associated with frequent involvement in computer games (Denniston, Swahn, Hertz, Romero, & 2011). Moreover, it is indicated that young people who had ever drunk alcohol were five times more likely to have played at least one of the 17 video games with tobacco or alcohol content compared to those who had never tried alcohol (Cranwell, Wittamore, Britton & Leonardi-Bee, 2016).

The reduced level of physical activity is associated with increased alcohol intake (Velleman, 2009). Research with 1-year students shows that those male university students who are not interested in physical activity are more dependent on alcohol (Podstawki, Gornik, &

Gizinska, 2013). However, higher levels of moderate, vigorous, and strengthening physical activity were associated with higher levels of alcohol consumption (VanKim et al., 2010). Also, some studies show that higher prevalence of risky single occasion drinking was found (Wicki et al., 2010) among those who were members of a sports team or who exercised regularly (DiGrande, Perrier, Lauro, & Contu, 2000). So, the research suggests a rather controversial idea of association between physical activity and alcohol use.

Literature indicates that hobbies are connected to alcohol use, e.g. playing a musical instrument (Velleman, 2009) is a significant tool as a disincentive to drink. Interpersonal associations indicated that alcohol use was lower among students who spent more time in spiritual and volunteering activities (Finlay, Ram, Maggs, & Caldwell, 2012) or participated in extracurricular activities (Elder, Leaver-Dunn, Wang, Nagy, & Green 2000). There is an idea that general participation in activities that do not include alcohol might reduce alcohol consumption among students (Sugarman & Carey, 2007). Moreover, some research show that activities which are social (involve more people) are more associated with alcohol consumption (Pendorf, 1992), while individual activities are less alcohol connected. However, this idea lacks stronger evidence and needs to be investigated in the future.

Literature indicates there is a link between parties with friends and alcohol consumption among students, e.g. the research show that students consume alcohol chiefly during social gatherings and for social and enhancement motives (Wicki et al., 2010), students tend to drink more during specific student holidays (Neighbors et al., 2007), on weekends (Johnston, O'Malley, Bachman, & Schulenberg, 2005), and in the places populated by students (e.g. campus) (Buettner, Khurana, & Slesnick, 2011).

The research on influence of peers is quite doubtful. In Townshend's (2013) research, participants stated that friends did not influence the alcohol consumption; however, interpersonal associations indicated that alcohol use was higher among individuals who spent more time involved in socializing (Finlay, Ram, Maggs, & Caldwell, 2012). Some argue that influences of peers are strong predictors of adolescent substance use (Walden, McGue, Iacono, Burt, & Elkins, 2004). The same situation might be true for students, especially when talking about socializing, activities together. However, this must be checked in the students' age group.

The research studies show the association between alcohol use and gambling, e.g. students who drink to cope and have other indicators of alcohol problems are more likely to gamble to cope, gamble to win money, and have higher gambling involvement and gambling-related problems (Hodgins & Racicot, 2013; Barnes, Welte, Hoffman, & Tidwell, 2010). Moreover, alcohol consumption was associated with larger average bets and more rapid loss of all available funds, though no evidence was found for predicted main effects and interactions for gambling persistence (Cronce & Corbin, 2010).

Study on problematic use of the Internet revealed that alcohol consumption was more frequent in cases of the problematic Internet use than without (Morioka et al., 2017). Also, some research works show that smartphone apps can make a brief interventions available to large numbers of university students, and the studies of smartphones apps seem to affect alcohol consumption among them (Gajecki, Berman, Sinadinovic, Rosedahl, & Andersson, 2014). Research on Greek students (Frangos, Frangos, & Sotiropoulos, 2011) indicates Internet addicted users and at-risk Internet users would consume bigger quantities of alcohol drinks than non-users. There are not many research works indicating the link between alcohol and this predictor; however, some sources indicate that, for example, Internet gamblers reported higher rates of tobacco, alcohol, and street drug use compared to their non-Internet counterparts (Wood & Williams, 2011).

The scientific overview of predictors shows the importance of the university students' alcohol consumption problem. However, alcohol consumption leads to more than one predictor, rather an entire complex of them (Borsari, Murthy, & Barnett, 2009). Therefore, it is appropriate to carry out a study of several predictor connections with alcohol consumption. This particular study aimed to examine leisure time activities and perceived risk of alcohol consumption to alcohol consumption, controlling for the possible effect of students' gender, age and employment.

The research question: Assuming if we control for the possible effect of students' gender, age and employment, are leisure time activities and perceived risks of alcohol use still able to predict a significant amount of the variances in students' alcohol use?

### **Research methodology**

This paper presents the data obtained from a survey of university students carried out in the fall of 2016. The implementation of the survey was coordinated with the authorities of Lithuanian universities. Upon authorities' permission, the following survey was coordinated with the heads of the contact persons who helped with the access to their university students. Invitations to participate in the study with reference to the survey profile were sent to randomly selected students' e-mail boxes. Students' anonymity, voluntary participation, respect for respondents, and institutions were ensured in all the stages of the investigation.

### **The sample**

While preparing the sample of the research it was aimed to ensure the representativeness by several aspects: adjustment of the population, sample size, and sampling method. University students' population has been limited by region and study mode. Since the survey took place under the funding of Lithuanian Ministry of Education and Science, it was held in Lithuania. Taking into account the conditions of the funding, the survey sample was limited under the study mode choosing full-time undergraduate students only. In 2016, there were 20 universities in Lithuania, and 18 universities agreed to participate in the study (in the remaining two the number of students is so small that it did not affect the overall statistical population of the students). There were 46,652 full-time undergraduate students in these universities. The student population in this study was set up proportionately representing all universities. The study sample consisted of 1,087 students: 37% of males and 63% of females. The average age of the respondents was 21 years, the minimum age was 18, the maximum was 29. The vast majority (95%) consisted of students under 24 years.

### **Instruments**

All the questions and answers were taken from the ESPAD questionnaire (<http://www.espad.org/>). According to the ESPAD procedures, the consent to use the questionnaire is not required.

Alcohol use. Three indices of university students' alcohol drinking were assessed: frequency of drinking and intoxication, frequency of drunkenness. The drinking frequency was represented by the mean of three items: "On how many occasions (if any) have you had any alcoholic beverage to drink: In your lifetime? During the last 12 months? During the last 30 days?" The intoxication frequency was represented by the mean of three items: "On how many occasions (if any) have you been intoxicated from drinking alcoholic beverages, for example, staggered when walking, not being able to speak properly, throwing up or not

remembering what happened: In your lifetime? During the last 12 months? During the last 30 days?" The respondents could choose from 7 answer options which were presented in an ascending order: 0 – no such cases; 1–2 cases; 3–5 cases 6–9 cases; 10–19 cases; 20–39 cases; 40 and more cases. In both cases, these items were internally consistent (Cronbach's  $\alpha = .848$  and  $\alpha = .720$ , respectively). Drunkenness was represented by a single item asking: "Please indicate how drunk you would say you were that last day you drank alcohol using this scale from 1 to 10 (if you felt no effect at all, you should mark "1"; "10" means you were heavily intoxicated, for example, not remembering what happened).

Students' leisure time activities. The scale consisted of 8 ordinal variables describing the diversity of leisure activities: \*active sports, training; \*reading of books (no study textbooks) for pleasure; \*computer games; \*attendance of discos, cafés, parties, and other similar events; \*hobbies (playing an instrument, singing, drawing, writing); \*leisure time with friends while socializing in shopping malls, parks, streets, etc.; \*leisure time spent browsing the Internet (chat, listening to the music, games, participation in social networks, video search and review, etc.); \*gambling. The respondents were asked how often they were engaged in the activities listed and were offered to choose one of the five answer options: \*never; \*a few times per year; \*one or two times per month; \*at least once per week; \*almost every day.

Perceived risks of alcohol use. The perceived risks of alcohol use were represented by the mean of three items: "How much do you think PEOPLE RISK harming themselves (physically or in other ways), if they have one or two drinks nearly every day? Have four or five drinks nearly every day? Have five or more drinks in one occasion nearly each weekend?" The respondents chose from 4 answer options presented in an ascending order: 1 – no risk, 2 – slight risk, 3 – moderate risk, 4 – great risk. These three items were internally consistent (Cronbach's  $\alpha = .790$ ).

### Analysis

A multiple regression was conducted using the SPSS to see how the perceived risk of drinking and various forms of leisure time activities predicted the alcohol use among university students. The hierarchical multiple regression was used to determine whether the perceived risk of drinking and various forms of leisure time activities explained variance in alcohol use among university students above and beyond variance accounted for by such socio-demographic variables known to be associated with high school students' drinking: gender (coded men=1; women=2), age (coded 18–20 years old=1, 21–29 years old=2), employment status (coded non-working=1, working=2). In this analysis, two blocks of independent variables were entered. The first block consisted of the variables of gender, age, and employment status. The second block consisted of the variables measuring leisure time activities and perceived risks of alcohol use. There were three dependent variables: frequency of drinking, frequency of intoxication, drunkenness.

Multiple regression analysis needs to have a continuous dependent variable, two or more continuous independent variables, the residuals should have a straight-line relationship with predicted scores of a dependent variable (linearity), the residuals should be normally distributed about the predicted scores of a dependent variable (normality), the variance of the residuals about predicted scores of dependent variable should be the same for all predicted scores (homoscedasticity), no multicollinearity (Pallant, 2007; Čekanavičius, 2011).

To test for possible problems with multicollinearity, collinearity diagnostics was performed. Tolerance values in all cases are less than .10, the VIFs (variance inflation factor)

are less than 4. Correlated analysis of independent variables showed that the highest correlation was 0.553 and it was much less than 0.9, which was considered as critical correlation indicating the multicollinearity. This suggests that the multicollinearity assumption was not violated. The scatter plots have the (approximate) shapes of a rectangle, the scores are concentrated in the center (around the 0 point) and distributed in a rectangular pattern with no clustering or systematic pattern. This means that the assumption of homoscedasticity is met. Normality was examined using Normal P-P Plots. These plots indicate that points lay in a reasonably straight diagonal line from bottom left to top right. This suggests no major deviations from normality. To look for influential outliers in a set of predictor variables and identify the points that negatively affect the regression model, the Cook's distance was used. The Cook's distance values in all three cases are less than 1. It suggests that there are no outliers in the regression models.

### Research results

Table 1 summarizes the multiple hierarchical linear regression analyses.

#### Frequency of drinking

Seventeen percent (17%) of the variance in the drinking frequency was accounted for by the variables in Block 1 (gender, age, employment). Employment and gender were significantly associated with an increase in the drinking frequency, whereas age was not. Men and employed individuals consumed more alcohol.

After Block 2 variables (leisure time activities and perceived risks of alcohol use) had been added to the model, it was found that the  $R^2 = 0.525$ , which means that a set of independent variables together accounted for 52.5% of the variance in the drinking frequency. The variables in Block 2 uniquely contributed by 35.5% to the regression model; as such, the combination of leisure time activities and perceived risks of alcohol use contributed substantially to the overall model. The Durbin-Watson  $d = 1.64$ , which is between the two critical values of  $1.5 < d < 2.5$  and, therefore, we can assume that there is no first order linear auto-correlation in our multiple linear regression data. The results are statistically significant ( $p = 0.000$ ;  $F = 8.738$ ;  $df = 12$ ).

When new variables (leisure time activities and perceived risks of alcohol use) were entered at step 2, only gender, employment, and two leisure time activities' variables (\*reading of books for enjoyment, \*going out in the evening to a disco, cafés, party, etc.) were significantly associated with the drinking frequency. Employed students ( $\beta = 0.255$ ;  $p = 0.006$ ), males ( $\beta = -0.252$ ;  $p = 0.010$ ), students going out in the evening to a disco, café, parties, etc. ( $\beta = 0.250$ ;  $p = 0.016$ ), not reading books for enjoyment ( $\beta = -0.500$ ;  $p = 0.000$ ) more frequently reported using alcohol.

#### Frequency of intoxication

Nine percent (9%) of the variance in the intoxication frequency were accounted for by the variables in Block 1 (gender, age, employment). No one of these variables was significantly associated with the intoxication frequency. After Block 2 variables (leisure time activities

and perceived risks of alcohol use) had been added to the model, there was found that the  $R^2 = .550$ , which means that a set of independent variables together accounted for 55% of the variance in the intoxication frequency. The variables in Block 2 uniquely contributed by 46% to the regression model; as such, the combination of leisure time activities and perceived risks of alcohol use contributed substantially to the overall model. The Durbin-Watson  $d = 1.73$ , which is between the two critical values of  $1.5 < d < 2.5$  and, therefore, we can assume that there is no first order linear auto-correlation in our multiple linear regression data. The results are statistically significant ( $p = 0.000$ ;  $F = 9.065$ ;  $df = 12$ ).

When new variables (leisure time activities and perceived risks of alcohol use) were entered at step 2, only gender, age, and five leisure time activities variables (\*active participation in sports, athletics or exercising, \*reading of books for enjoyment, \*going out in the evening to a disco, café, party, etc., \*hobbies, \*socializing with friends in shopping centers, streets, parks, etc. just for fun) were significantly associated with the intoxication frequency. Older students ( $\beta = 0.343$ ;  $p = 0.000$ ), males ( $\beta = -0.230$ ;  $p = 0.021$ ), students going out in the evening to a disco, café, parties, etc. ( $\beta = 0.426$ ;  $p = 0.000$ ), socializing with friends in shopping centers, streets, parks, etc. just for fun ( $\beta = 0.213$ ;  $p = 0.037$ ), not having hobbies (e.g. playing an instrument, singing, drawing, writing) ( $\beta = -0.175$ ;  $p = 0.038$ ), not reading books for enjoyment ( $\beta = -0.453$ ;  $p = 0.000$ ), actively not participating in sports, athletics or exercising ( $\beta = -0.285$ ;  $p = 0.001$ ) more frequently experienced intoxication from alcohol.

### **Drunkeness**

Six percent (6%) of the variance in drunkness were accounted for by the variables in Block 1 (gender, age, employment). The age was significantly associated with an increase in drunkness, whereas the gender and employment were not. It indicates that older drink more.

After Block 2 variables (leisure time activities and perceived risks of alcohol use) had been added to the model, there was found that the  $R^2 = 0.355$ , which means that a set of independent variables together accounted for 35.5% of the variance in drunkness. The variables in Block 2 uniquely contributed by 29.5% to the regression model; as such, the combination of leisure time activities and perceived risks of alcohol use contributed substantially to the overall model. The Durbin-Watson  $d = 2.01$ , which is between the two critical values of  $1.5 < d < 2.5$  and, therefore, we can assume that there is no first order linear auto-correlation in our multiple linear regression data. The results are statistically significant ( $p = 0.000$ ;  $F = 4.321$ ;  $df = 12$ ).

When new variables (leisure time activities and perceived risks of alcohol use) were entered at step 2, only gender, age, two leisure time activity variables (\*going out in the evening to a disco, café, party, etc., \*hobbies) were significantly associated with drunkness. Older students ( $\beta = 0.311$ ;  $p = 0.004$ ), males ( $\beta = -0.279$ ;  $p = 0.019$ ), students often going out in the evening to a disco, café, parties, etc. ( $\beta = 0.300$ ;  $p = 0.012$ ), not having hobbies (e.g. playing an instrument, singing, drawing, writing) ( $\beta = -0.351$ ;  $p = 0.001$ ) experienced higher levels of drunkness when last day they had drunk alcohol.

**Table 1.** Standardized ( $\beta$ ) and non-standardized (b) predictors of dependent variables and significance (p) in university students' alcohol use

Independent variables	Dependent variables								
	Drunkenness			Intoxication frequency			Drinking frequency		
	b	$\beta$	p	b	$\beta$	P	b	$\beta$	p
Step 1									
Gender	-0.138	-0.036	0.715	-0.312	-0.152	0.122	-0.668	-0.201	0.030
Age	1.071	0.270	0.015	0.444	0.208	0.058	-0.029	-0.009	0.934
Employment	-0.638	-0.159	0.146	0.170	0.081	0.455	1.255	0.367	0.001
Step 2									
Perceived risks of alcohol use	0.116	0.142	0.160	-0.033	-0.078	0.356	0.080	0.117	0.174
Playing the computer games	-0.161	-0.112	0.290	-0.024	-0.032	0.723	-0.111	-0.091	0.314
Active participation in sports, athletics or exercising	-0.084	-0.056	0.546	-0.228	<b>-0.285</b>	0.001	-0.193	-0.152	0.052
Reading of books for enjoyment (not counting study books)	0.167	0.115	0.329	-0.371	<b>-0.453</b>	0.000	-0.618	<b>-0.500</b>	0.000
Going out in the evening (to a disco, café, party, etc.)	0.570	<b>0.300</b>	0.012	0.211	<b>0.213</b>	0.037	0.400	<b>0.250</b>	0.016
Other hobbies (playing an instrument, singing, drawing, writing)	-0.539	<b>-0.351</b>	0.001	-0.146	<b>-0.175</b>	0.038	-0.153	-0.117	0.183
Socializing with friends in shopping centers, streets, parks, etc. just for fun	0.410	0.205	0.075	0.433	<b>0.426</b>	0.000	0.316	0.187	0.062
Using the Internet for leisure activities (chats, music, games, social networks, videos, etc.)	-0.266	-0.107	0.335	0.168	0.129	0.168	0.011	0.005	0.955
Playing on slot machines (the kind in which you may win money)	-0.512	-0.158	0.107	0.108	0.075	0.389	-0.358	-0.150	0.083
Gender	-1.082	<b>-0.279</b>	0.019	-0.471	<b>-0.230</b>	0.021	-0.836	<b>-0.252</b>	0.010
Age	1.236	<b>0.311</b>	0.004	0.733	<b>0.343</b>	0.000	-0.151	-0.144	0.625
Employment	-0.522	-0.130	0.223	-0.183	-0.088	0.333	0.871	<b>0.255</b>	0.006
R <sup>2</sup>	Step 1 R <sup>2</sup> = 0.063 Step 2 R <sup>2</sup> = 0.355			Step 1 R <sup>2</sup> = 0.088 Step 2 R <sup>2</sup> = 0.550			Step 1 R <sup>2</sup> = 0.162 Step 2 R <sup>2</sup> = 0.525		

## Discussion

The current study sought to examine if leisure time activities and perceived risks of alcohol use still able to predict a significant amount of the variances in students' alcohol use, when they are controlled for the possible effect of students' gender, age, and employment? The study confirms previous findings (Foster et al, 2014; Goštautas et al., 2007, 2009; Wicki et al., 2010) that male university students are bigger consumers of alcohol than female. Our study shows that male students drink alcohol, have intoxication more often and have more drinks on one occasion. Meanwhile, the hypothesis about alcohol connection and age of university students was confirmed only partially. In the view of the facts that older people are bigger alcohol users (HSCIC, 2013), it was expected that older students (21–29 age) were bigger alcohol consumers than younger students (18–20 age); however, the study has shown that older students drank more on one occasion and had intoxication; however, the influence of the frequency of alcohol consumption was not identified. Students' employment significantly related to alcohol use frequency; however, the link between intoxication frequency and drunkenness was not established. The trend between employment and the frequency of alcohol use was established, what confirms the research results of Butler et al. (2010).

Overall, the results indicated that, controlling for possible effects of gender, age, and employment, leisure time activities were significant predictors of university students' alcohol use, whereas the perceived risk of alcohol use was not. As it was mentioned, there is no one answer about the association between perceived risk of alcohol use and drinking. On the one hand, there is evidence of the fact that alcohol use among young adults is associated with lower perceived risk of using alcohol (Yeomans-Maldonado et al., 2015), other research studies show the perceptions of drinking risk were less important to the explanation of alcohol involvement (Lewis & Thombs 2005). Our findings about perceived risk of alcohol use go in line with the suggestions proposed by Lewis and Thombs (2005).

Analyzing associations between students' leisure time activities and alcohol use, the going out in the evening (to a disco, café, party, etc.) is a particularly distinguished predictor of alcohol consumption. These results confirm the already known fact about the link between parties with friends and alcohol consumption among students (Wicki et al., 2010; Neighbors et al., 2007), but it enriched the knowledge of understanding that students often going out in the evening to a disco, café, parties, etc. more frequently used alcohol, more frequently were intoxicated, were more drunk on one occasion of alcohol use. As it was mentioned, the research on peers' influence and alcohol use was rather doubtful (Townshend, 2013). It seems that alcohol use is higher among individuals who spend more time involved in socializing (Finlay et al., 2012). Our study partially confirms this hypothesis; it was found that more experienced in intoxication students more often were socializing with friends in shopping centers, streets, parks, etc. just for fun. However, the link with the alcohol use frequency and drunkenness failed.

Based on the results from earlier studies (Hodgins et al., 2013; Barnes et al., 2009, 2010, Morioka et al, 2017; Frangos et al., 2011), it was expected that the leisure time activities, such as computer gaming, Internet use, gambling, were significant as the predictors of university students' alcohol consumption, together with other leisure time activities, it became clear that their role was not statistically significant.

The investigation showed a positive effect of participation in sports, athletics or exercising role. Exercising university students less frequently experienced intoxication from alcohol. However, we failed to establish a link with the more frequent use of alcohol or drunkenness,

thus based on Velleman (2009), Podstawki et al., (2013) including such insights. Assumptions about the connection between hobbies and alcohol use (Velleman, 2009; Sugarman & Carey, 2007; Elder et al. 2000) have been proven. Students having hobbies (e.g. playing an instrument, singing, drawing, and writing) experienced lower levels of drunkenness when last day they had drunk alcohol and less frequently were intoxicated, even though the link with the alcohol consumption frequency set failed. Students reading books for enjoyment used alcohol and were intoxicated less frequently. However, the link with lower levels of drunkenness was not established. These important facts concerning hobbies and reading of books confirm the role of alcohol prevention expressed by Pendorf (1992), Sugarman and Carey (2007); it means individual activities are less alcohol-connected, and social activities with friends and other people are more associated with alcohol consumption.

There are some general limitations of the current study. Firstly, the study population was limited to full-time studies, distancing themselves from the part-time and postgraduate studies. Secondly, measure of perceived risks of alcohol use was limited to a number of risks and that could affect the test results.

The findings gave an important implication to education and public health. Results of the study suggest that in order to control the university students' drinking it is needed to increase opportunities for young people to engage themselves in their favorite activities: reading books for pleasure, active participation in sports, athletics or exercising, artistic expression, and other activities.

Future research should attempt to replicate this study by part-time students and among postgraduate students. Moreover, it is appropriate to repeat the study using more alcohol consumption instruments with detailed perceived risks.

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## LEISURE TIME ACTIVITIES, PERCEIVED RISKS OF DRINKING AND SELECTED SOCIO-DEMOGRAPHIC VARIABLES AS PREDICTORS OF UNIVERSITY STUDENTS' ALCOHOL USE

### Summary

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The scientific overview of predictors shows the importance of the university students' alcohol consumption problem. However, alcohol consumption leads to more than one predictor, rather an entire complex of them. Therefore, it is appropriate to carry out a study of several predictor connections with alcohol consumption. This particular study aimed to examine leisure time activities and perceived risk of alcohol consumption to alcohol consumption, controlling for the possible effect of students' gender, age and employment.

The research data was obtained from a survey of university students carried out in the fall of 2016. The research sample consisted of 1,087 university undergraduate full-time students: 37% of males and 63% of females. The average age of the respondents was 21 years. All the questions and answers were taken from the ESPAD questionnaire. Students' anonymity, voluntary participation, respect for respondents, and institutions were ensured in all the stages of the investigation.

A multiple regression was conducted using the SPSS to see how the perceived risk of drinking and various forms of leisure time activities predicted the alcohol use among university students. The hierarchical multiple regression was used to determine whether the perceived risk of drinking and various forms of leisure time activities explained variance in alcohol use among university students. Block 1 consisted of the variables of gender, age, and employment status. Block 2 consisted of the variables measuring leisure time activities and perceived risks of alcohol use. There were three dependent variables: frequency of drinking, frequency of intoxication, drunkenness.

17% of the variance in the drinking frequency was accounted for by the variables in Block 1. Employment and gender were significantly associated with an increase in the drinking frequency, whereas age was not. Men and employed individuals consumed more alcohol. After Block 2 variables had been added to the model, it was found that the  $R^2 = 0.525$ , which means that a set of independent variables together accounted for 52.5% of the variance in the drinking frequency. The Durbin-Watson  $d = 1.64$ ; therefore, we can assume that there is no first order linear auto-correlation in our multiple linear regression data. When new variables (leisure time activities and perceived risks of alcohol use) were entered at step 2, only gender, employment, and two leisure time activities' variables (\*reading of books for enjoyment, \*going out in the evening to a disco, etc.) were significantly associated with the drinking frequency.

9% of the variance in the intoxication frequency were accounted for by the variables in Block 1. No one of these variables was significantly associated with the intoxication frequency. After Block 2 variables had been added to the model, there was found that the  $R^2 = .550$ , which means that a set of independent variables together accounted for 55% of the variance in the intoxication frequency. The Durbin-Watson  $d = 1.73$ ; therefore, we can assume that there is no first order linear auto-correlation in our multiple linear regression data. When new variables (leisure time activities and perceived risks of alcohol use) were entered at step 2, only gender, age, and five leisure time activities variables (\*active participation in sports, athletics or exercising, \*reading of books for enjoyment, \*going out in the evening to a disco, etc., \*hobbies, \*socializing with friends in shopping centers, etc.) were significantly associated with the intoxication frequency.

6% of the variance in drunkenness were accounted for by the variables in Block 1. The age was significantly associated with an increase in drunkenness, whereas the gender and employment were not. It indicates that older drink more. After Block 2 variables had been added to the model, there was found that the  $R^2 = 0.355$ , which means that a set of independent variables together accounted for 35.5% of the variance in drunkenness. The Durbin-Watson  $d = 2.01$ ; therefore, we can assume that there is no first order linear auto-correlation in our multiple linear regression data. When new variables (leisure time activities and perceived risks of alcohol use) were entered at step 2, only gender, age, two leisure time activity variables (\*going out in the evening to a disco, etc., \*hobbies) were significantly associated with drunkenness.

The results are statistically significant in all three aspects (drinking frequency, intoxication frequency, and drunkenness) investigated among university students. Leisure time activities may offer both risk and protective effects for university students. Such leisure time activities as active participation in sports, athletics or exercising, reading of books for enjoyment, various hobbies, decreased going out in the evening to a disco, café, etc., and decreased socializing with friends in shopping centers, etc. can protect university students from frequent and heavy alcohol use.

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