

ALCOHOL EXPECTANCIES AND ALCOHOL USE ACROSS CZECH UNIVERSITY STUDENTS

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Abstract

This cross-sectional study of 960 Czech students (18-37 years old) shows alcohol expectancies predict high-risk drinking, despite 40% reporting decreased consumption post-COVID. Social enhancement/aggression expectancies drive quantity, while tension reduction predicts frequency. These findings reveal key drivers of problematic drinking, informing tailored public health policies.

Keywords

Alcohol expectancies, alcohol use, substance misuse, drinking behaviour.

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1. Introduction

Alcohol, despite its widespread cultural acceptance, is recognized as a harmful drug that is both physically and psychologically highly addictive. In addition, according to the WHO, alcohol is responsible for up to 3 million deaths a year, with approximately 13.5 % of all deaths in the 20-39 age group occurring as a result of alcohol consumption. Various studies have reported that the highest prevalence of alcohol consumption is among university students (Hingson, 2010; Stone *et al.*, 2012). This trend is prevalent in the Czech Republic, with problematic alcohol use recently found amongst university students (Gavurova *et al.*, 2021). Despite the apparent trend within European countries of decline in alcohol consumption during the first waves of the COVID-19 pandemic in 2020 (Kilian *et al.*, 2021), consumption due to ongoing social and mental health challenges is of concern, especially for those at risk of hazardous use (Matone *et al.*, 2022). Longitudinal data from Sweden highlight the alcohol related risks young people experience due to loneliness and mental health problems since the COVID-19 pandemic (Mohamed *et al.*, 2024).

Recent findings have highlighted the cognitive and psychological processes that are an important aspect of growing alcohol related problems. The perceived likelihood that alcohol consumption will have certain consequences may play a role in the frequency and quantity of alcohol consumption and in this context, it is referred to as alcohol expectancies (AE). Expectancies can thus be operationalized as the perceived likelihood

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that a certain outcome will result from a situation. For instance, an expectation that consuming alcohol will improve one's ability to socialize or impede one's ability to think clearly. Research in this area has gained prominence in recent years, with evidence supporting the robust associations between AE and alcohol consumption in various populations (Brislin *et al.*, 2020; Ham *et al.*, 2005; Jones *et al.*, 2001; Nicolai *et al.*, 2010; 2012; Smit *et al.*, 2018; Young *et al.*, 2005; Zamboanga *et al.*, 2006).

Although peer and environmental influences contribute significantly to the prediction of drinking rates in university students, AE have been shown to play a much larger role (Ham & Hope, 2003; Martin & Hoffman, 1993). AE could explain up to 45% of the variance in alcohol use and up to 25% in long-term drinking (Leigh, 1989), with large-scale longitudinal studies indicating AE at age 16 years uniquely predict alcohol use at both 26 and 35 years (Patrick *et al.*, 2010). Among university students, research shows that AE predict 12.8% of the variance in drinking frequency (Young *et al.*, 2005).

Examining the AE model, these expectancies can be divided into positive and negative. Positive AE include an increased sense of sociability, courage, improved sexual enjoyment, a dimension of calm and relaxation and others. Negative AE include undesirable cognitive changes, negative affect, aggression and physical discomfort following alcohol use (Brown, 1985; Farber *et al.*, 1980; Jones *et al.*, 2001; Nicolai *et al.*, 2010).

There is general consensus that people who consumed more alcohol reported more positive AE than those who consumed less alcohol. Also, more drinking experiences have been consistently associated with the development of positive expectancies (Brown *et al.*, 1987; Carey, 1995; Christiansen & Goldman, 1983; Fromme & D'Amico, 2000; Fromme *et al.*, 1993; Southwick *et al.*, 1981). While findings regarding the protective and predictive role of negative AE were less consistent: Some studies have found a negative association between negative AE and drinking, suggesting the protective potential of negative AE (Fromme & D'Amico, 2000; Nicolai *et al.*, 2010), while others have found that negative AE are associated with higher rates of problem drinking (Zamboanga *et al.*, 2010).

However, it seems that the concept of negative and positive AE are highly relative concepts, which could explain the inconsistency in the research. For example, while most individuals rate cognitive-behavioral impairments (impaired attention, perception, motor skills, etc.) following alcohol consumption negatively, some college students consider these effects to be positive (Fromme & Rivet, 1994). Similarly, "negative" expectancies, which are theorized to act as protective factors against drinking, have been shown to be related to increased rather than decreased alcohol consumption (Mann *et al.*, 1987; McMahon *et al.*, 1994). This could reflect that those who consume greater amounts of alcohol have more negative alcohol experiences (Hasking & Oei, 2002; Lee *et al.*, 1999), but it may also suggest that 'negative' expectancies are not rated negatively by all individuals, just as not all 'positive' expectancies may be rated positively by all individuals (Nicolai *et al.*, 2017). Additionally, within- and between individual differences over time in AE have been shown and these are moderated by gender, with women evincing higher rates of fluctuation in AE than men (Schultz *et al.*, 2021).

Despite the strength of AE findings there is a paucity of research into their influence on Czech populations, including student populations. The purpose of this research was to map the drinking behaviour of Czech university students and to determine to what extent AE of university students predict and are correlated to alcohol consumption, both in frequency and quantity. By accurately analyzing the predictive role

of alcohol expectancies among Czech university students in relation to drinking frequency (calculating average annual drinking frequency) and drinking quantity (calculating average drinking quantity by different types of alcoholic beverages), while also exploring how factors such as gender, age and age of first alcohol experience influence these relationships, a scientific basis for targeted intervention strategies for university student drinking may be provided. These aims are summarized in specific research questions:

RQ1: How frequently and in what quantity are Czech university students consuming alcohol and are there gender differences between consumption in men and women?

RQ2: Do Czech university students perceive themselves as consuming more or less alcohol since the COVID-19 pandemic?

RQ3: To what extent do positive and negative alcohol expectancies predict the frequency and quantity of alcohol consumption among Czech university students?

2. Methods

2.1. Study design

To answer the research questions a cross-sectional design was selected to provide a cost-effective means of obtaining sufficient data whilst limiting participant demand.

2.2. Participants

The research was conducted nationwide on a convenience sample of university students aged 18-37 years from the majority of Czech public universities in 2021. Participants were recruited through social media. After briefing regarding study aims and potential risks, participants provided consent to participate, then completed an online questionnaire. In total, over 968 students participated in the research, of which 8 were excluded for non-valid responses. A total of 960 remained (M age = 21.6 years, SD = 2.15). Females accounted for 43.8% (N = 420). In addition, 54.1% of the sample were single and 45.4% were matched. Participants were distributed by academic stage as follows: 37.9% of the respondents were in their first year of study, 11.3% were in their second year, 12.5% were in their fourth year, 10.4% were in their fifth year, 1% were in their sixth year and 1.9% were in a doctoral program. The largest representation was from technical disciplines, accounting for 36%, followed by business and economics fields at 15% and humanities and social sciences at 13% (e.g., journalism, psychology, linguistics). Natural sciences (such as molecular biology, chemistry, etc.) comprised 11%, healthcare-related fields (pharmacy, veterinary medicine, medicine, etc.) made up 13%, agricultural sciences accounted for 4%, legal studies for 4% and other disciplines (e.g., hospitality management, military studies) represented less than 3%. No compensation was offered for participation.

2.3. Measures

2.3.1. Frequency and quantity of drinking

These criteria were measured by an instrument developed by the National Institute of Mental Health as part of the Dry February campaign (NÚDZ, 2021); not all items were used, but only those mapping frequency and quantity of drinking. Participants were also asked about changes in their drinking behaviour before and during the COVID-19

pandemic. Alcohol consumption was assessed according to the following criteria: a) number of drinking days in the last year (frequency); b) number of drinks (beer, wine or spirits) in an average drinking day in the last year (quantity).

Frequency was quantified by the following procedure:

a) A maximum value was calculated from the reported frequency of beer, wine and spirits consumption and averaged with the reported frequency of alcohol consumption in general to produce an objectified frequency of consumption.

b) If the answer was for example two or three times per week, an average of 2.5 was created and multiplied by the number of weeks in a year (52) i.e., the value of this frequency was quantified to 130 days of consumption per year.

c) If the answer was for example two or three times per month, an average of 2.5 was created and multiplied by the number of months in a year (12) i.e., the resulting value was 30.

d) If the participant stated that they never drank or did not drink alcohol, a value of 0 was assigned.

Quantity was measured by the reported number of average glasses consumed on a typical day of alcohol consumption. A new variable was created to represent the average of the reported number of glasses consumed on a typical day of consumption and the number of glasses of beer/cider, wine and spirits consumed on a typical day of consumption. A glass of alcohol was equivalent to 500ml of beer, 2dcl of wine or 0.04 liters of spirits.

2.3.2. Consumption behaviour

Participants were asked whether they typically drink four/five or more glasses of alcohol per sitting, this question mapped the frequency of binge drinking in the research sample. The type of alcohol consumed (beer/cider, wine, spirits) was also mapped.

2.3.3. Alcohol expectancies

The revised CAEQ - The Comprehensive Alcohol Expectancy Questionnaire (Nicolai *et al.*, 2010) was used to assess alcohol expectancies. Czech and German culture demonstrate similar salient characteristics of the Hofstede index, such as low indulgence, uncertainty avoidance, individualism and long-term orientation (Hofstede, 2011). As can be seen in Kilian *et al.* (2021), Czech drinking habits during the COVID-19 pandemic reflected changes in Germany, with each country exhibiting a decline in consumption in 2020. The CAEQ therefore appears to be highly applicable to the Czech population. Forward translation from English to Czech was done by Co-Author LS. Co-Author JD back-translated. Co-authors LS, JD and KR met and agreed with the final version (S1). Participants rated their subjectively experienced consequences after alcohol consumption on a Likert scale from 1-5. 1- for strongly disagree to 5- for strongly agree. The CAEQ contains five subscales: (a) Social Assertiveness and Positive Affect, (b) Tension Reduction, (c) Cognitive Impairment and Physical Discomfort, (d) Aggression and (e) Sexual Enhancement.

The α values for the subscales of the revised 41-item CAEQ were highly consistent in both the student sample (alpha ranging from 0.78 to 0.92) and the clinical sample (alpha ranging from 0.78 to 0.93) (Nicolai *et al.*, 2010).

Cronbach's alpha (α) in the current study reached the following values:

1. Social assertiveness and positive affect (15 items; $\alpha = 0.92$);

2. Tension reduction (7 items; $\alpha = 0.87$);
3. Cognitive impairment and physical discomfort (10 items; $\alpha = 0.86$);
4. Aggression (4 items; $\alpha = 0.89$);
5. Sexual enhancement (5 items; $\alpha = 0.83$).

2.3.4. Controls

Age and age of first alcohol experience have been shown to predict alcohol consumption behaviours in previous literature. Therefore, items capturing this data were included to be used as controls.

2.4. Analytical procedure

Correlation analysis was used to determine the relationship between the variables and regression analysis was used to determine the degree of influence of one variable on the other. ANOVA was used to determine group differences between the genders. These methods were implemented using IBM SPSS 27 Statistics software. The significance level was set at 1% instead of 5% to avoid Type I errors, as there were multiple comparisons, with multiple predictor variables selected based on extant literature to specify a model with explanatory power and the policy implications were discussed.

3. Results

3.1. Mapping alcohol consumption behaviour

To answer RQ1, survey results for alcohol consumption behaviours were summarised and assessed for gender differences. Alcohol consumption metrics of frequency and quantity, including binge drinking prevalence, demonstrate marked gender differences.

3.1.1. Frequency and quantity of alcohol consumption among men and women

Men and women differed significantly in the quantity of alcohol consumed. A univariate ANOVA revealed a significant difference in the reported number of average glasses consumed on a typical day of alcohol consumption between the sexes ($F=55.58$, $df=1/958$, $p<.001$, $\eta^2=0.55$): for men ($M=4.29$, $SD=2.64$) and for women ($M=3.19$, $SD=1.95$). For mean quantity of alcohol consumption, ANOVA also showed a statistically significant effect of gender on quantity of alcohol consumed ($F=52.01$, $df=1/958$, $p<.001$, $\eta^2=0.05$): for men ($M=3.63$, $SD=1.93$) and for women ($M=2.83$, $SD=1.53$). Frequency of alcohol consumption was statistically different only at the 5% significance level ($F=5.01$, $df=1/956$, $p<.005$, $\eta^2=0.05$). The prevalence of alcohol consumption was higher in men ($M=72.76$, $SD=70.18$) than in women ($M=62.87$, $SD=64.87$). Since the significance level in this research is set at 1%, this result cannot be considered statistically significant; men and women do not differ statistically significantly in the frequency of alcohol consumption.

3.1.2. Binge drinking

For men, binge drinking is defined as drinking five or more drinks on one occasion, with about 53.6 % of men engaging in this practice frequently to almost always. For women, binge drinking is defined as drinking four or more drinks on one occasion

and data show that about 35.9 % of women engage in this practice frequently to almost always.

In our sample, for binge drinking four or more glasses of alcohol on one occasion, the chi-square values were statistically significant ($X^2(3, N=960) = 94.161, p < .001, V = .313$), as were those for drinking five or more glasses ($X^2(3, N=960) = 77.219, p < .001, V = .284$). Thus, there is a moderately close and statistically significant relationship for binge drinking as a function of gender. Men were more likely than women to report that they almost always drink four or more glasses on one occasion (28 %), whereas women were less likely to do so (13.5%). In the case of five or more glasses drunk on one occasion, 23 % of men drink them almost always, compared to 8.5 % of women. Men are therefore significantly more likely than women to practice binge drinking.

3.1.3. COVID-19 and drinking practice

In answer to RQ2, the data show that university students drink significantly less after the pandemic than before, with only about 10% of students drinking more than before the pandemic. Approximately 13% of students now consume alcohol with greater frequency but in smaller quantities. In contrast, only 5% of students consume alcohol in larger quantities, but with less frequency. About a quarter of students reported that their drinking behavior had not changed with the onset of the pandemic. At least subjectively, reported alcohol consumption decreased during the COVID-19 pandemic. This may be due, for example, to a deficit in socialization factors that normally lead to higher consumption.

3.2. Results regarding alcohol expectancies

To answer RQ3, relationships between variables were described and inferential statistical tests performed to determine the extent to which AE predict alcohol consumption. In this research sample participants rated their expectancies of alcohol in the following order:

1. Social assertiveness and positive affect (factor 1);
2. Tension reduction (factor 2);
3. Sexual enhancement (factor 5);
4. Cognitive impairment and physical discomfort (factor 3);
5. Aggression (factor 4).

Table 1. Descriptive statistics of the comprehensive alcohol expectancy questionnaire in a sample of 960 Czech University students

Alcohol expectancies	Min	Max	Mean	SD
Social assertiveness and positive affect	1.00	5.00	3.56	0.81
Tension reduction	1.00	5.00	3.25	0.95
Cognitive impairment and physical discomfort	1.00	5.00	3.00	0.82
Aggression	1.00	5.00	1.69	0.91
Sexual enhancement	1.00	5.00	3.14	1.02

Note: SD = Standard Deviation

The individual AE, described in Table 1, are significantly correlated with each other in all cases, as demonstrated in Table 2, indicating considerable consistency and the possible existence of a reciprocal relationship between the different types of AE. The

closest relationships exist between the AE of social assertiveness and positive affect, tension reduction and sexual enhancement. Expectancies of tension reduction and sexual enhancement have a moderately close relationship with each other.

Table 2. Pearson's correlations for all alcohol expectancies in a sample of 960 Czech University students

CAEQ Scale	Social assertiveness and positive affect	Tension reduction	Cognitive impairment and physical discomfort	Aggression
Social assertiveness and positive affect	-			
Tension reduction	0.59***	-		
Cognitive impairment and physical discomfort	0.27***	0.21***	-	
Aggression	0.18***	0.11***	0.22***	-
Sexual enhancement	0.47***	0.35***	0.09**	0.15***

Note: * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

3.2.1. Gender differences in alcohol expectancies

ANOVA showed a significant difference in two of the five AE dimensions. In Table 3 below, a significant difference based on gender was found for the AE of aggression and the AE of sexual enhancement. Men expect to be more aggressive after alcohol than women. On the other hand, women expect greater sexual enhancement after alcohol than men. The results suggest that in the rest of the AE men and women share similar beliefs.

Table 3. Series of one-way ANOVA for gender differences in alcohol expectancies in a sample of 960 Czech University students

Dependent variable	Men		Women		F	df ₁	df ₂	p	η^2
Alcohol expectancies	M	SD	M	SD					
Social assertiveness and positive affect	53.84	11.86	53.14	12.46	0.77	1	958	0.381	0.001
Tension reduction	22.29	6.50	22.53	6.71	1.06	1	958	0.303	0.001
Cognitive impairment and physical discomfort	29.60	8.32	30.39	8.12	2.17	1	958	0.141	0.002
Aggression	7.15	3.88	6.46	3.43	8.35	1	958	0.004**	0.009
Sexual enhancement	15.27	4.72	16.06	5.32	5.87	1	958	0.016**	0.006

Note: * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$, M = Mean, SD = Standard Deviation, F = F-value, df = Degrees of Freedom, η^2 = Eta Squared

3.2.2. Correlations between age, age of first alcohol experience, alcohol expectancies and alcohol consumption quantity

As detailed in Table 4, higher age demonstrated significant negative correlation with the AE of sexual enhancement only. Lower age of first alcohol experience was associated with AE of aggression and of tension reduction. Both age and age of first alcohol experience, exhibited negative correlation with quantity of alcohol consumption. All demonstrated a small effect size.

Table 4. Pearson's correlations between alcohol expectancies, alcohol consumption quantity, age and age of first alcohol experience in a sample of 960 Czech University students

Alcohol expectancies	Social assertiveness and positive affect	Tension reduction	Cognitive impairment and physical discomfort	Aggression	Sexual enhancement	Quantity
Age	-0.07*	-0.07*	0.06	-0.01	-0.12***	-0.12***
Age of first alcohol experience	-0.07*	-0.09**	-0.05	-0.09**	-0.02	-0.11**

Note: * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

3.2.3. Correlations between alcohol expectancies, quantity and frequency of alcohol consumption

As indicated in Table 5, the quantity of alcohol consumption was positively and significantly correlated with all positive AE and most strongly with the AE of social assertiveness and positive affect. However, the AE of cognitive impairment and physical discomfort was negatively correlated with the quantity of alcohol consumption only at the 5% significance level, which cannot be considered significant for the present research. Frequency of alcohol consumption was significantly correlated only with the AE of tension reduction after alcohol, indicating a link between people who consume alcohol more frequently and the expectation that alcohol will reduce experienced tension.

Table 5. Pearson's correlations between alcohol expectancies and alcohol consumption by quantity and frequency in a sample of 960 Czech University students

Alcohol expectancies	Social assertiveness and positive affect	Tension reduction	Cognitive impairment and physical discomfort	Aggression	Sexual enhancement
Quantity	0.24***	0.17***	-0.07*	0.21***	0.13***
Frequency	0.01	0.11**	-0.05	0.02	0.03

Note: * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

3.2.4. Predictors of frequency of alcohol consumption

Linear regression analysis, detailed in Table 6, revealed the only significant predictor explaining variance in alcohol consumption frequency is the AE of tension reduction. Gender, age and age of first alcohol experience did not prove to be statistically significant predictors despite their models achieving statistical significance. The variables gender and age predicted the frequency of alcohol consumed ($F(2,955) = 3.17$, $p < 0.005$, $R^2 = .007$). When the variable age of first alcohol experience (in years) was added, the proportion of explained variance changed as follows: $F(2,954) = 2.65$, $p < 0.005$, $R^2 = 0.008$. Adding AE factors 1-5 increased the proportion of explained variance: $F(8,949) = 3.38$, $p < 0.001$, $R^2 = 0.028$. Thus, it can be concluded that gender, age, age of first alcohol experience and AE are significant predictors of alcohol consumption frequency at the 1% significance level and explain about 2.8% of the variance in alcohol consumption frequency.

Table 6. Linear regression: Gender, age, first alcohol experience, alcohol expectancies as predictors of frequency of alcohol consumption in a sample of 960 Czech University students

Model and predictors	B	SE _B	β	t	p
Model 1					
Constant	47.90	22.48		2.13	0.033
Gender	-9.29	4.41	-0.07	-2.10	0.036
Age	1.14	1.02	0.04	1.12	0.264
Model 2					
Constant	66.36	26.84		2.47	0.014
Gender	-9.10	4.41	-0.07	-2.06	0.039
Age	1.11	1.02	0.04	1.09	0.275
Age of first alcohol experience	-1.23	0.98	-0.04	-1.26	0.208
Model 3					
Constant	48.58	30.26		1.61	0.109
Gender	-8.05	4.45	-0.06	-1.81	0.071
Age	1.54	1.02	0.05	1.51	0.131
Age of first alcohol experience	-0.99	0.98	-0.03	-1.01	0.311
Social assertiveness and positive affect	-0.44	0.24	-0.08	-1.82	0.070
Tension reduction	1.58	0.41	0.15	3.84	0.001***
Cognitive impairment and physical discomfort	-0.54	0.28	-0.07	-1.93	0.054
Aggression	0.46	0.62	0.02	0.74	0.457
Sexual enhancement	0.32	0.49	0.02	0.65	0.513

Note: * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$, B = unstandardised regression coefficient, SEB = standard error of the coefficient, β = standardised regression coefficient
Dependent variable: frequency of alcohol consumption

3.2.5. Predictors of the quantity of alcohol consumption

Linear regression analysis, detailed in Table 7, was used to test predictors of the quantity of alcohol consumption. Gender, age and age of first alcohol experience significantly predicted the quantity of alcohol consumption. Regarding individual AE, social assertiveness and positive affect was the most significant predictor, followed by aggression, then cognitive impairment and physical discomfort. Higher levels of cognitive impairment and physical discomfort were significantly associated with lower quantity of alcohol consumption. Expectancies of tension reduction and sexual enhancement were not significant in explaining variance in quantity of alcohol consumption. The analysis also shows a trend for lower age of first alcohol experience associated with higher quantity of alcohol consumption.

Gender and age significantly predicted the quantity of alcohol consumed ($F(2,957) = 37.39$, $p < 0.001$, $R^2 = 0.072$). After adding AE factors 1-5, the proportion of explained variance given by the regression model increased ($F(7,952) = 27.39$, $p < 0.001$, $R^2 = 0.168$). After adding the variable age of first alcohol experience (in years), the proportion of explained variance changed as follows: $F(9,951) = 25.02$, $p < 0.001$, $R^2 = 0.174$. Thus, the variables gender and age explained about 7.2% of the variability in quantity of alcohol consumption and after adding the five types of AE, the model explained about 16.8% of the variability in quantity of alcohol consumption. Together with age of first alcohol experience, the proportion explained rose to 17.4%. Thus, it can be concluded that gender, age, AE and age of first alcohol experience are significant predictors of quantity of alcohol consumption at the 1% significance level.

Table 7. Linear regression: gender, age, first alcohol experience, alcohol expectancies as predictors of quantity of alcohol consumption in a sample of 960 Czech university students

Model and predictors		B	SE _B	β	t	p
Model 1						
Constant		6.25	0.57		11.00	<0.001***
Gender		-0.87	0.11	-0.24	-7.81	<0.001***
Age		-0.12	0.03	-0.15	-4.65	<0.001***
Model 2						
Constant		7.51	0.67		11.13	<0.001***
Gender		-0.86	0.11	-0.24	-7.74	<0.001***
Age		-0.12	0.03	-0.15	-4.74	<0.001***
Age of first alcohol experience		-0.08	0.02	-0.11	-3.41	0.001**
Model 3						
Constant		5.06	0.73		6.94	<0.001***
Gender		-0.74	0.11	-0.21	-6.91	<0.001***
Age		-0.09	0.02	-0.11	-3.70	<0.001***
Age of first alcohol experience		-0.06	0.02	-0.08	-2.67	0.008**
Social assertiveness and positive affect		0.03	0.01	0.21	5.12	<0.001***
Tension reduction		0.01	0.01	0.04	1.08	0.281
Cognitive impairment and physical discomfort		-0.03	0.01	-0.16	-5.06	<0.001***
Aggression		0.08	0.01	0.17	5.48	<0.001***
Sexual enhancement		<0.01	0.01	0.01	0.39	0.699

Note: *p <0.05, **p <0.01, ***p <0.001, B = unstandardised regression coefficient, SEB = standard error of the coefficient, β = standardised regression coefficient
Dependent variable: quantity of alcohol consumption

4. Discussion

A survey of the drinking behaviour of Czech university students has shown binge drinking as highly prevalent, though 40% of respondents reported drinking less after the COVID-19 pandemic. Quantity of alcohol consumption was positively correlated with all positive AE, positively predicted by the AE of social enhancement and aggression and was negatively predicted by the AE of physical discomfort and cognitive impairment. Frequency of alcohol consumption was positively correlated with and predicted by the AE of tension reduction. Differences in AE and consumption behaviours by gender, age and age of first alcohol experience were found. These findings will now be discussed.

Regarding RQ1, men were found to consume alcohol in significantly greater quantities than women. However, men and women do not differ significantly in the reported frequency of alcohol consumption. As many as 35.9 % of women and 53.6 % of men were found to engage in binge drinking often or almost always when consuming alcohol. Similar results are described by Wechsler and Nelson (2008) in their survey.

Regarding RQ2, up to 40% of students reported drinking less after the onset of the COVID-19 pandemic than before, while only 5% of students reported drinking more in general after the onset of the pandemic. This can be attributed to the lack of socializing factors due to the closure of businesses and the cancellation of full-time classes for most courses of study.

Regarding RQ3, when examining the differences in individual AE based on the gender of the participants, significant differences were found in the expectancy of sexual enhancement, with females scoring higher, whereas males scored higher in the expectancy of aggression. Quantity of alcohol consumption was correlated at the 1% significance level with each dimension of AE, with small to medium effect size. These

findings add to the growing body of evidence on the importance of expectancies in social empowerment and alcohol consumption behaviours among students (Ham & Hope, 2003; Monk & Heim, 2013; Scheier & Botvin, 1997).

Frequency of alcohol consumption was significantly correlated only with tension reduction expectancies ($r = .11$), which is partially inconsistent with previous research (Nicolai *et al.*, 2010) in which frequency was related to most dimensions of alcohol expectancies. It may be hypothesized that there is an association between people who consume alcohol more frequently and these expectancies.

Higher age was negatively correlated with the expectation of sexual enhancement ($r = -0.12$) and quantity of alcohol consumption ($r = -0.12$). Thus, it may be concluded that there is an association between increasing age of students and lower quantity of alcohol consumption. It can also be hypothesized that the expectation of sexual enhancement effects of alcohol decreases with increasing age. This correlation partially supports the findings of Nicolai *et al.* (2012), where expectancies related to social assertiveness and sexual enhancement in particular were strong predictors only for younger respondents, but not for those over 24 years of age. These results may be related to higher levels of sexual activity following alcohol consumption among individuals in emerging adulthood (Arnett, 2001; Grello *et al.*, 2006).

Age of first alcohol experience was negatively correlated with AE of tension reduction ($r = -0.09$) and aggression ($r = -0.09$) and for quantity ($r = -0.11$). From the results, it can be concluded that there is a weak association between earlier alcohol experience and current expectancies of aggression, sexual enhancement and higher quantity of alcohol consumption.

The result of the regression analysis showed that gender and age were significant predictors of the quantity of alcohol consumed, which is consistent with the findings of previous research (Nicolai *et al.*, 2010; 2012; 2017). In this case, age was a significant negative predictor ($\beta = -0.15$), as was age of first alcohol experience ($\beta = -0.08$), which is consistent with the results of the correlation analysis described above. Regarding individual AE, quantity of alcohol consumed was most significantly positively predicted by expectancies of social assertiveness and positive affect ($\beta = 0.21$) and aggression ($\beta = 0.17$) and negatively predicted by cognitive impairment and physical discomfort expectancies ($\beta = -0.16$). Negative alcohol expectancies were also a strong negative predictor of the amount of alcohol consumed and frequency of drinking among respondents over 23 years of age in previous research (Nicolai *et al.*, 2012). Expectancies of tension reduction were not significantly associated with quantity of alcohol consumption, which also supports previous research (Nicolai *et al.*, 2012, 2017). In contrast, the expectation of aggression was positively associated with quantity of alcohol consumed ($\beta = 0.17$), which contradicts previous findings by Nicolai *et al.* (2012), where aggression was not found to be a significant predictor of either frequency or quantity of alcohol consumed. However, the expectancy of aggression and aggression itself after alcohol consumption have been found to interact strongly with the amount of alcohol consumed (Borders *et al.*, 2007; Bye, 2007). The contrast between expectancies of aggression and cognitive impairment and physical discomfort, although usually grouped as negative expectancies, evince a contradiction; aggression is valued as a positive expectancy in this population, particularly for males. In other cultures, such as Latino, excessive drinking has been shown to relate to acceptance of aggressive gender roles (Perrotte & Zamboanga, 2021), though meta-analytic syntheses of findings suggest this finding does not reflect the broader literature (Pinquart & Borgolte, 2024). This nuanced

insight signals a normative element to aggression in this population that must be considered for further research. A regression model with predictors of gender, age of participants and age of first alcohol experience, along with individual AE, explained about 17.4% of the variance in quantity of alcohol consumption among university students. Therefore, AE alone accounted for 9.6% of the variance. These findings are broadly consistent with previous findings in AE research (Nicolai *et al.*, 2012; Zamboanga *et al.*, 2006). In a previous study utilising the CAEQ, with a German student sample (Nicolai *et al.*, 2010), gender, age and AE explained 11% of the variance in the quantity of student drinking. As the present study found the proportion of variance explained rose to 16.8% without including age of first drinking experience, the increase in explanatory power is most reasonably attributable to differences between the German and Czech student population. However, the difference is modest and evidently a greater proportion of alcohol consumption behaviour is explained by factors outside the models tested. Future research into the interaction of AE with theoretically related variables is required to bring further insight to alcohol consumption in this population.

In predicting alcohol consumption frequency, AE, gender and age accounted for only about 3% of the variance. Drinking frequency was significantly positively predicted only by the expectation of tension reduction after drinking ($\beta = 0.15$). This result corroborates the findings of Nicolai *et al.* (2010), where tension reduction also significantly positively predicted frequency of alcohol consumption in individuals aged 24-29 years (Nicolai *et al.*, 2012). In previous research, students who specifically use alcohol for coping reported higher weekly drinking frequency (Britton, 2004). Thus, the expectation of tension reduction following alcohol may contribute to risky drinking and subsequent alcohol abuse if the person does not have other mechanisms by which to cope with distressing situations. Previous research data suggests that frequency of alcohol consumption and expectancies of tension reduction are significant predictors for the 24-29-year-old group, but are more closely associated with increasing age (30-59 years) (Nicolai *et al.*, 2012). This predictor becomes more important with increasing age. Thus, the relatively small representation of older persons (only 0.8% of persons are over 28 years of age) in the current study may explain the presence of a weaker and less significant correlation between these variables ($r = -0.07$; $p < 0.05$).

The findings from this study have public health implications and practical application in university pastoral services. For instance, since educational programs, including harm reduction workshops which target modification of AE, have been shown in recent meta-analysis to benefit university students (Gesualdo & Pinquart, 2021), these are indicated to reduce Czech university students' risk from the deleterious effects of alcohol. Consistent with previous literature for this age group, our findings demonstrate such educational interventions should focus on reducing positive AE and on the risks of binge drinking (Tsuda-McCaie & Kotera, 2022). Evidence suggests that higher dose interventions, rather than single session delivery, will be most effective (Gesualdo & Pinquart, 2021). Recruitment to such programs could be practically facilitated during enrolment. Although men were found to be at greater risk of problematic alcohol use than women in the present study, the numbers of both genders shown to be at risk are such that interventions should be delivered to all genders (Kotera *et al.*, 2023), with content tailored to address men's expectations of aggression and women's expectations of sexual enhancement.

4.1. Limitations

AE can vary significantly in different social contexts (Bot *et al.*, 2005; Larsen *et al.*, 2012; Wechsler & Nelson, 2008), which could not be controlled for in this research. Results could vary considerably when completing AE questionnaires in a particular setting and situation. In addition, the AE measurement instrument relies on the subjective statements of the participants, thus there may be a self-report and memory-induced bias effect (Kotera *et al.*, 2022). The same issue applies to retrospective self-assessment questions on frequency and quantity of alcohol consumption, where reported data may be greatly overestimated or vice versa. Participants had aged by approximately one year from the onset of the COVID-19 pandemic to the time of data collection, during which maturational effects may have confounded drinking behaviour changes attributed to environmental factors (Kotera, 2021; Kotera *et al.*, 2021). Thus, all of the above factors may significantly negatively affect the ecological validity of the current research (Kuendig & Kuntsche, 2012). Frequency and quantity were positively skewed and due to the sample size, a univariate analysis of variance was used. Given the sample size, the results can be considered robust to the assumption of non-normality of the data distribution. The internal validity of the research may be compromised by the choice of the CAEQ questionnaire, which was not standardized to the Czech population. However, it has been validated by back-translation and independent translation methods. Further psychometric validation of the translated scale is recommended for future research. It should also be mentioned that the results of this research are not representative of the whole population. Relatedly, this study did not evaluate the differences across student subjects. Mental health differences across different subjects are reported (Kotera *et al.*, 2019; 2020; 2021; 2022). Because self-report measures were used, the accuracy of the student responses might have been compromised (Kotera *et al.*, 2020). The correlational nature of the research allowed only associations to be tested and not causality. In this regard, it may be beneficial to use an experimental design that allows for stronger inferences about causal relationships (e.g., longitudinal study) (Kotera *et al.*, 2024). Appraising the first-hand experience would be also beneficial (Kotera, 2018). Similarly, future research should examine AE in conjunction with other cognitive constructs, such as current emotional state.

5. Conclusion

This work has provided a number of new insights that can be applied to the assessment and understanding of AE, which can inform public health policy and university pastoral provision. Currently, the prevention and treatment of risky drinking and alcohol abuse is primarily guided by existing work in the field of cognitive therapy. However, there appears to be little consideration of the extent to which one's own expectancies of alcohol predict drinking behaviour. The findings of this study demonstrate that AE have predictive power for both quantity and to a lesser extent, frequency of alcohol use in Czech university students; a novel finding for this population, which has been shown to exhibit problematic alcohol use. This study has brought nuance to available evidence in this area, which is conflicting. Further research into AE as risk factors for alcohol consumption is strongly recommended, preferably in the context of other factors such as individuals' genetic predispositions, personality characteristics and differences in psychopathology.

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