

# Analysis of Gender Differences in Alcohol Use and Related Problems among University Students in Minsk, Belarus

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**Abstract**—There is a variety of inconsistencies in the differences in alcohol use and related problems between male and female genders. This study was aimed at analyzing the gender differences in alcohol use and related problems among university students in Minsk, Belarus. A total of 465 male (average age of 21) and 1030 female (average age of 20.5) students from four major universities in Minsk, Belarus were administered WHO recommended standardized screening instruments – AUDIT, MAST, CAGE questionnaire, as well as other alcohol related questions. The male to female ratio for the prevalence of alcohol problems according to the AUDIT was 3.34, while the ratio for alcohol users was 0.97. There are a wide gender differences in the pattern of alcohol use and preference for different alcoholic beverages, cause for drinking, and other alcohol related problems like injuries and blackouts.

**Keywords**—Alcohol related problems, Gender differences, University students, Belarus.

## I. INTRODUCTION

THERE is a variety of inconsistencies of data concerning the differences in the prevalence and pattern of alcohol use and related problems between male and female genders [1]. Although, no significant gender differences in the proportion of alcohol users were recorded by [2] in a study of 247 respondents in Uganda, other studies show a significant difference in alcohol use by both genders [1] – [3]. References [1], [4] report that generally, men drink more often than women, and as such they encounter more alcohol-related problems. Gender differences in alcohol related problems depend not only on individual-biological constitution, but also on the pattern of alcohol use within a given geographical location [1].

In most cases, alcohol problems are not only caused by the quantity of alcohol use, but also increase in frequency of drinking [1], [5] – [7]. The mean frequency of drinking in some European countries is estimated to be 40% – 250%

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higher among men than among women. In countries like Austria, Germany, the Netherlands, Switzerland, France, and Spain, men drink on the average once in two to three days, while women drink once in four to six days. A typical man to female ratio in cases of alcohol involvement is 2-3, although this ratio slightly differs in different countries [1], [6]. The prevalence of binge drinking (5 or more drinks per session) among male and female varies substantially. For example, bingeing is most reported by men than women in Czech Republic (60.2% and 24.9% respectively), compared to Iceland (men: 33.1%; women: 21.3%) [1]. In Belarus, there is a dearth of data addressing the gender differences in the pattern of alcohol use and related problems. A screening result that will address the prevalence of alcohol use and related problems among male and female genders will be of great importance [8] – [11].

Recent epidemiological data show high level of alcoholization among male students [8], [10], [12]. In the general Belarusian students' population, the issue of gender differences in alcoholization remains unpronounced. We therefore examined the prevalence of alcohol use and related problems among males and females in the general Belarusian students' population in major universities in Minsk, Belarus.

## II. MATERIALS AND METHODS

### A. Study Population and Location

Minsk is the capital city of Belarus, where majority of students from all over the country study. All screening investigations were carried out in major universities in Minsk – Belarusian State Medical University, Belarusian State University, Belarusian State Agro-Technical University and Belarusian State National Technical University, where majority of students in Minsk (Belarus) study. Some percentages of foreigner (approximately 0.1% of the general students population) also study in these universities. More than 68% of all students in these universities are females.

### B. Sampling Size and Techniques

A total of 2500 students at random from the various universities in Minsk were explained the study aims and objectives, only those who agreed to participate were involved in the study. Out of the 2500 students, 1581 students

responded for the study. Out of 1581 students, 82 could not satisfactorily complete the questionnaire, so only 1499 students were considered for analysis. About 1% of the respondents were foreigners from Iran, Jordan, Pakistan, Syria, Nigeria and Ghana. The 1499 students included 1030 females (average age = 20.5yrs) and 469 males (average age = 21.0yrs). A high proportion of respondents in this study were Christians (over 90%), others were Muslims and Atheists.

#### C. Procedures

The Ethics and Research Committee of the various universities approved the study protocol. Students were recruited from class to participate in this study of the prevalence of alcohol use and related problems. General informed consent was verbally obtained from the students to be screened after the aims and objectives of the survey had been explained. The study was anonymous. A paper-and-pencil based method was utilized in the screening process. Participants were administered standardized WHO questionnaires which have been verified and adopted for use in Belarus: the Alcohol Use Disorders Identification Test (AUDIT), MAST (Michigan Alcohol Screening Test), and CAGE (the Cut, Annoyed, Guilty and Eye questionnaire) [12], including other alcohol related questions. Questionnaires were administered equally in all years of study in the various universities.

#### D. Measures

A score of  $\geq 8$  on the AUDIT defines problematic alcohol use. Non-problematic alcohol use was determined on the AUDIT from scores 1 to 7. Abstinence was defined as a score of zero on the AUDIT. Students with scores  $\geq 1$  were considered as alcohol users. A score of 2-4 on the CAGE test was considered clinically significant. Students with scores of  $\geq 3$  on the MAST were defined as problem drinkers (problematic alcohol use) [12]. In this study, a standard drink was set at 8g (10 ml) of absolute ethanol.

#### E. Statistical Analysis

Statistical calculations were performed using SPSS (Statistical Package for the Social Sciences) 16.0 version for Windows and the criteria of Student's t-test and Chi-square ( $\chi^2$ ). The probability value for significance was set at  $p < 0.05$ . All volumes of alcohol are given in values of absolute ethanol. Results are displayed as means and standard error of means ( $M \pm m$ ), as well as in percentages, %.

### III. RESULTS

Overall, 85.7% of the males and 88.5% of the females (male/female ratio 0.97) were identified as alcohol users on the AUDIT. A total of 33.7% of males and 10.1% of females were problem drinkers (male/female ratio 3.34). The average statistical values of all participants (males and females) on the AUDIT, MAST and CAGE are given in table 1.

TABLE I  
PERCENTAGES OF ALCOHOL USERS AND PROBLEM DRINKERS, INCLUDING THEIR MEAN SCORES ON THE AUDIT, CAGE AND MAST

Sex	Average score			Alcohol users, %	Problem students, %		
	A	C	M		A	C	M
Males (469)	7.1 $\pm$ 0.3	0.9 $\pm$ 0.1	1.9 $\pm$ 0.1	85.7 (402)	33.7 (158)	28.6 (134)	22.4 (105)
Females (1030)	3.4 $\pm$ 0.1	0.4 $\pm$ 0.0	0.7 $\pm$ 0.1	88.5 (912)	10.1 (104)	11.2 (115)	5.8 (60)

Note: A= AUDIT, C = CAGE, M= MAST

Even though the percentage of alcohol users was higher among females than among males, the average scores of males were significantly greater than the scores of the females by 2.1; 2.1; and 2.5 times according to the AUDIT, CAGE and MAST respectively (Table 1). The percentages of problem drinkers among male students were significantly higher by 3.3 times ( $p < 0.001$ ); 2.6 times ( $p < 0.001$ ); 3.8 times ( $p < 0.001$ ) than among female students based on the AUDIT, CAGE and MAST respectively (Table 1).

TABLE II  
MONTHLY FREQUENCY AND DOSE OF ALCOHOLIC BEVERAGES FOR ONE STUDENT PER MONTH AS WELL AS PERCENTAGES OF VARIOUS ALCOHOL RELATED PROBLEMS AMONG THE PROBLEM (PD) AND NON-PROBLEM DRINKERS (NPD). ONLY ALCOHOL USERS (n=1314)

Parameters	Male students (n=402)			Female students (n=912)		
	PD	NPD	Total	PD	NPD	Total
Dose/session (ml)	51.2 $\pm$ 4.3	26.7 $\pm$ 1.0	45.0 $\pm$ 5.0	43.3 $\pm$ 3.5	23.8 $\pm$ 1.0	38.4 $\pm$ 4.0
Frequency/month	4.4 $\pm$ 0.1	1.5 $\pm$ 0.1	2.9 $\pm$ 0.4	3.9 $\pm$ 0.4	1.3 $\pm$ 0.0	2.6 $\pm$ 0.4
Monthly dose (ml)	223.0 $\pm$ 8.0	39.5 $\pm$ 2.2	131.2 $\pm$ 27.9	170.4 $\pm$ 24.9	31.4 $\pm$ 0.8	100.9 $\pm$ 24.1
Loss of control, %	49.4 $\pm$ 6.5	6.2 $\pm$ 1.2	27.8 $\pm$ 7.2	40.7 $\pm$ 8.0	2.1 $\pm$ 0.5	21.4 $\pm$ 7.0
Hangover, %	42.5 $\pm$ 4.1	0.9 $\pm$ 0.6	21.7 $\pm$ 6.6	33.6 $\pm$ 9.7	1.7 $\pm$ 0.3	17.7 $\pm$ 6.7
Blackouts, %	62.1 $\pm$ 4.0	8.5 $\pm$ 1.5	35.3 $\pm$ 8.3	56.6 $\pm$ 9.5	4.4 $\pm$ 0.6	30.5 $\pm$ 9.1
Injury, %	59.2 $\pm$ 5.6	6.4 $\pm$ 2.5	32.8 $\pm$ 8.5	45.8 $\pm$ 7.0	2.4 $\pm$ 0.4	24.1 $\pm$ 7.3
Guilt, %	58.4 $\pm$ 5.0	25.4 $\pm$ 4.4	41.9 $\pm$ 5.9	66.4 $\pm$ 4.4	15.9 $\pm$ 1.5	41.1 $\pm$ 7.9

Note: PD = problem drinkers, NPD = Non-problem drinkers

From Table 2, the quantity of alcohol use by the non-problem drinkers per session was significantly lower than the quantity use by the problem drinkers. No significant differences amongst the problem drinkers and non-problem drinkers of both genders were recorded. The total quantity of alcohol use was approximately the same for both genders. The frequency of alcohol use was more for the male problem

drinkers by 1.1 times, compared to the female problem drinkers, however this result was not statistically significant (Table 2 and 3). Among the females, frequency ratio of the problem drinkers to the non-problem drinkers was 5.4. While for the males the ratio was 5.7. Among the males, cases of hangover increased significantly above scores of  $\geq 8$  on the AUDIT (~ 46 times,  $p < 0.005$ ) more than for a female students with the same average score (Table 2 and 3). The quantity and frequency of alcohol use, including cases of alcohol related problems were significantly higher among the problem drinkers of both genders (Table 2 and 3). Highly significant ratio differences ( $> 2$  times) in the cases of hangover and loss of control between the males and females were recorded. No significant differences in the total ratio were noted (Table 3).

TABLE III  
RATIOS OF MONTHLY FREQUENCY AND DOSE OF ALCOHOLIC BEVERAGES FOR ONE STUDENT PER MONTH AND THEIR CORRESPONDING ALCOHOL RELATED PROBLEMS AMONG THE PROBLEM (PD) AND NON-PROBLEM DRINKERS (NPD). ONLY ALCOHOL USERS (n=1314)

Parameters	Male (n=402)	Female (n=912)	Ratio (male <sub>total</sub> /female <sub>total</sub> )	
	Ratio (PD/NPD)	Ratio (PD/NPD)	PD (m/f)	NPD (m/f)
Monthly frequency	2.95**	2.98**	1.11	1.12*
Monthly dose	5.65**	5.42**	1.31*	1.26**
Loss of control	8.02**	19.47**	1.21	2.94**
Hangover	46.14**	19.40*	1.26	0.53
Blackouts	7.30**	12.74**	1.10	1.92*
Injuries	9.31**	18.91**	1.29	2.63
Guilt	2.30**	4.18**	0.88	1.60*

\* $p < 0.05$ , \*\* $p < 0.0001$

Note: PD = problem drinkers, NPD = Non-problem drinkers, m = males, f = females

From Table 4, majority of both males and females use weak strength alcoholic beverages. Significant percentage of males (16.84%) use beer, wine and spirit in their combination, compared to only 5.05% of females. On the average, a significant number of students use alcoholic beverages mainly for celebrations, and was higher for females than for males by 1.4 times. Trouble and unpleasant situation were not a deciding factor for the gender differences in drinking pattern (Table 4). The cases of drinking on days of wages and stipends were often reported among males, compared to the females (male/female ratio – 3.6). On the question “why do you drink alcohol?”, significantly higher percentage of males reported alcohol use for its sweet qualities, compared to a fewer females who use alcohol for this purpose (Table 4). Bad mood as factor that encouraged alcohol use was significantly recorded among the males (8.10%, n=38) than for the females (1.94%, n=20).

TABLE IV  
DIFFERENT PREFERENCES AND MOTIVES OF ALCOHOL USE BY MALES AND FEMALES (n=1499)

Parameters		Male (n=469), %	Female (n=1030), %	Male to female Ratio
Alcoholic beverages?	Beer/dry wine	41.36 (n=194)	77.67 (n=800)	0.53** ( $\chi^2=190.14$ )
	Beer/strong wine	8.53 (n=40)	5.73 (n=59)	1.49 ( $\chi^2=4.10$ )
	Spirits (vodka etc)	17.06 (n=80)	3.30 (n=34)	5.17** ( $\chi^2=86.79$ )
	Beer/wine/spirits	16.84 (n=79)	5.05 (n=52)	3.33** ( $\chi^2=56.22$ )
Major causes for drinking	Celebrations	56.72 (n=266)	80.29 (n=827)	0.71** ( $\chi^2=90.69$ )
	Trouble/unpleasantness	0.85 (n=4)	1.07 (n=11)	0.79 ( $\chi^2=0.15$ )
	Day of wages/stipends	8.74 (n=41)	2.43 (n=25)	3.60** ( $\chi^2=30.53$ )
Why do you drink alcohol?	Tradition to use alcohol	19.40 (n=91)	21.75 (n=224)	0.89 ( $\chi^2=1.07$ )
	Sweet qualities of wine	27.72 (n=130)	34.27 (n=353)	0.81* ( $\chi^2=6.34$ )
	Drinking to get drunk	16.63 (n=78)	14.85 (n=153)	1.12 ( $\chi^2=0.78$ )

\* $p < 0.05$ , \*\* $p < 0.0001$

#### IV. DISCUSSION

The cut-off point for problematic alcohol use in this study is in agreement with the recommended cut-off for the various screening instruments in Belarus [12].

This study shows that the prevalence of alcohol use and related problems is high in the general student population in Belarus. The fact that problem drinkers were more in the male population, compared to the females, even though the percentage of alcohol users was higher the females may be related to many factors. Male students might often use alcohol for socializing purposes and during leisure than their female counterparts [1], [12], [13]. Significantly higher proportions of the males use alcohol on days of wages and stipends and for the sweet qualities of wine, compared to the females. Besides, the use of alcoholic beverages in their combination was significantly higher in the male students' population (Table 4). The dose and frequency of alcohol use per month by the males was higher than that of the females. Correspondingly, the higher the quantity of alcohol use the greater the effect (the dose response effect) [12]. For instance, the higher quantity of alcohol use by the problem students led to a significantly higher level of alcohol problems, compared to the non-problem students (Table 2 and 3).

Gender differences in alcohol use might also be influenced by religion, cultural and societal norms [1]. The protective effect of religion was not recorded in this study, although significantly higher number of Christians responded (~93%), compared to only ~6% Muslims and 1% non-religious respondents. The higher proportion of Christian respondents

was conditioned by the large number of Christians in this country, compared to the Muslims and non-religious people.

It has been noted in earlier studies that the MAST might show low sensitivity when used for determining the level of alcohol related problems in some populations. And that the CAGE might be highly sensitive among the Belarusian population [12], [13]. This was the rationale for using multiple screening tests in this study. The overall percentage of female problem drinkers on the MAST was lower, compared to the results on the AUDIT and CAGE (Table 1). The MAST is probably less sensitive, compared to the AUDIT and CAGE among the general Belarusian students' population. All three screening tests (AUDIT, CAGE and MAST) showed almost the same results (in regards to the percentage of problem drinkers) among the male students' population (Table 1).

*Study Limitations:* The fact that some respondents with alcohol related problems may have under-reported them in the AUDIT, MAST and CAGE, might have affected the significance of the results. Another limitation is that the questionnaire was administered ones and so the reliability indices of the various tests were not assessed. Another source of bias is the cultural tendencies to hide alcohol-related problems that may affect reliability of estimations by self-reporting. The fewer sample of the males, compared to the females, could have affected the reliability and significance of the results.

## V.CONCLUSION

Significant differences in alcohol use and related problems exist across gender lines in the general Belarusian students' population. The percentage of alcohol users was higher among female students, but the prevalence of alcohol problems according to the AUDIT was significantly higher among males. Higher alcohol related problems in the male students' population were conditioned by such factors as higher quantity of alcohol use, as well as some peculiarities in the motives of drinking (for the sweet qualities of wine, day of wages and stipends, trouble and unpleasant situations, and celebrations). The females mainly use alcohol for celebrations. Preference for weak strength alcoholic beverages (e.g. beer) was higher among the females, while the males prefer spirits, as well as alcoholic drinks in their combination (beer/wine/spirits).

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