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**Dates:** Received: 13 August, 2014; Accepted: 16 February, 2015; Published: 18 February, 2015**\*Corresponding author:** Y E Razvodovsky, 230009, Grodno, str. Gorky 80, Belarus, E-mail: razvodovsky@tut.by[www.peertechz.com](http://www.peertechz.com)

ISSN: 2455-3484

**Keywords:** Unrecorded alcohol; Drinking pattern; Alcohol dependent patients; Belarus

## Research Article

# Unrecorded Alcohol Consumption among Alcohol Dependent Patients

**Abstract**

**Introduction:** Experts estimate that unrecorded alcohol makes up a significant share (about 25%) of all alcohol consumed in the former Soviet Republic Belarus. However, our knowledge with respect to the prevalence of the consumption of unrecorded alcohol in this country, as well as the patterns and motives of its consumption remains fragmented.

**Objectives:** This study was designed to explore the prevalence, drinking pattern, types, reasons and correlates of the consumption of unrecorded alcohol among alcohol dependent patients.

**Methods:** The study was conducted in the Belarusian city Grodno in 2013 with 326 alcohol dependent patients (223 men and 103 women) admitted to narcological clinic using structured interviews.

**Results:** The results suggest that 52.9% of men and 30.3% of women regularly consume samogon (moonshine), while 11.8% of men and 10.8% of women use surrogates, the most popular among which are medications with a high percentage of ethanol and industrial spirits. The belief that, according to quality criteria, samogon exceeds licensed vodka is the main motive for its consumption.

**Conclusions:** The results from present study confirm that the consumption of unrecorded alcohol is common among alcohol dependent patients even though its use may have been underreported. These findings emphasize the urgency of implementing comprehensive alcohol policy, which needs to address overall consumption, harmful drinking patterns and taking into account the consumption of alcohol from illicit sources.

## Introduction

There is a common belief that alcohol is a crucial factor in the mortality crisis in the former Soviet Republics [1-5]. In Belarus, for example, it has been estimated that alcohol may be responsible for 28.4% of all male deaths and for 16.4% of female deaths [6,7]. The high level of alcohol-related problems in the region is caused by a combination of the high overall level of alcohol consumption, prevalence of unrecorded alcohol and harmful drinking patterns [2,4,5,8,9]. In Belarus, especially in small towns and in rural regions, it is typical to consume unrecorded beverages [7,10-12]. Experts estimate that unrecorded alcohol makes up a significant share (about 25%) of all alcohol consumed in this country [12]. According to WHO definition, unrecorded alcohol includes homemade informally produced alcohol, illegally produced or smuggled alcohol products, as well as surrogate alcohol that is not intended for human consumption [13]. Unrecorded alcohol in Belarus not only includes illegally produced spirits (samogon), but also legal non-beverage alcohols (surrogates), such as industrial spirits, denatured alcohol, medicinal tinctures, perfumes [7].

Despite the extreme urgency of the problem, relatively few studies so far focused on unrecorded alcohol consumption in Belarus [7]. One previous study confirms the widespread use of privately made strong alcoholic drinks in Belarus with 41% of men and 19% of women obtaining same or all of their alcohol from private sources [14]. A recent survey, undertaken in the city of Grodno found that 31.7% of men and 9.9% of women drank samogon at least one time a month, while 5.0% of men and 1.9% of women occasionally consumed

alcohol surrogates [12]. However, our knowledge with respect to the prevalence of the consumption of unrecorded alcohol in Belarus, as well as the patterns and motives of its consumption remains fragmented. The aim of this study was to some extent to fill this gap by studying the prevalence, types of unrecorded alcohol consumed, patterns of consumption and reasons behind unrecorded alcohol consumption among alcohol dependent population in Belarus.

## Materials and Methods

The study was conducted in the Belarusian city Grodno in 2013 with 326 alcohol dependent patients (223 men and 103 women) admitted to narcological clinic using structured interviews. Data was collected by trained interviewers through structural face-to-face interviews in the respondents' wards and lasted approximately 30 minutes. The questionnaire covered a range of characteristics including socioeconomic and demographic variables, drinking frequency of all beverage types including unrecorded alcohol, the amount of each beverage type drunk on a usual occasion defined in quantity units commonly used (bottles of beer, grams of wine and vodka), information about health problems arising from the consumption of alcohol with emphasis on unrecorded alcohol (hangover, poisoning), the motives that guided responders in their choice of alcoholic beverages, the sources of unrecorded alcohol, the opinion of responders regarding the quality of licensed alcohol and unrecorded alcohol. For non-beverage alcohol (surrogate) only frequency of consumption was asked since there are no

standard measures of volume consumed. The statistical analysis for the information from structured interview was conducted using Microsoft Excel where the data was tabulated and evaluated.

## Results

### Description of the sample

Before presenting the main results of the study, some social and demographic characteristics need to be provided for the respondents who took part in the study. Selected sample characteristics are summarized in **Table 1**. The average age was  $39.7 \pm 12.2$  years for men and  $43.0 \pm 13.4$  years for women. The majority of men (56.8%) and women (67.2%) were single. The majority of men (77.0%) and women (77.9%) also had a secondary education, while 19.5% of men and 20.0% of women had a higher education. By social status the respondents were distributed as follows: white-collar workers (8.7% of men and 18.5% of women), blue-collar workers (51.8% of men and 58.4% of women), retirees (6.2% of men and 3.1% of women), and unemployed (33.3% of men and 20.0% of women). The respondents are broken down by income level as follows: below average (43.3% of men and 54.5% of women), average (34.8% of men and 30.9% of women), and above average (22.0% of men and 14.6% of women).

### Types of alcohol consumed and patterns of consumption

According to the results of this study, 28.7% of men and 81.1% of women consume alcohol several times a week, while 63.4% of men and 18.9% of women consume alcohol every day (**Table 2**). The results of the survey showed that 40.8% of men prefer vodka, 39.2% consume vodka and beer, and 37.3% consume vodka and fortified wines. The preference for alcoholic beverages among women appears as follows: 40.0% consume vodka, 24.0% consume vodka and fortified wines, 20.7% consume vodka and beer, and 15.5% consume dry wine.

The overall level of alcohol consumption per capita per year (in terms of absolute alcohol) was 31.2 liters for men and 15.5 liters for women or 23.4 liters on average, which significantly more than the official sales level in 2013 - 12.3 liters per capita. According to the results of the survey, during one drinking occasion 33.3% of men and 37.3% of women consume 150 to 300 ml of vodka, 30.5% of men and 7.5% of women consume 300 to 500 ml of vodka, 33.2% of men and 13.4% of women consume more than 500 ml of vodka.

**Table 2:** Self-reported consumption of alcohol and surrogates (in percentages).

| Drinking variables                                     | males<br>n 223 | females<br>n 103 |
|--|----------------|------------------|
| Frequency of drinking                                  |                |                  |
| Several times a week                                   | 28.7           | 81.1             |
| Every day  | 63.4           | 18.9             |
| Binge drinking   |                |                  |
| 150 to 300 ml of vodka during one drinking occasion    | 33.3           | 37.3             |
| 300 to 500 ml of vodka during one drinking occasion    | 30.5           | 7.5              |
| more than 500 ml of vodka during one drinking occasion | 33.2           | 13.4             |
| Drinking of noncommercial alcohol                      |                |                  |
| Samogon  | 52.9           | 30.3             |
| Counterfeit vodka                                      | 36.2           | 11.9             |
| Homemade wine  | 34.3           | 12.1             |
| Surrogates   | 11.8           | 10.8             |

of women consume from 300 to 500 ml of vodka, and 33.2% of men and 13.4% of women consume more than 500 ml of vodka. Overall, women were 1.7 times less likely to report episodic heavy drinking than males.

### Prevalence and reasons for drinking noncommercial alcohol

According to the data obtained, one of the most popular types of noncommercial alcohol among the population is samogon that is consumed occasionally (at least once a month) by 52.9% of men and 30.3% of women. Answers to the question regarding the reasons for consuming samogon are distributed as follows: "samogon is chemically a purer product than licensed vodka" - 43.7% of men and 55.0% of women, "the cheapness of samogon" - 27.6% of men and 10.0% of women, "samogone is a traditional alcoholic beverage" - 18.4% of men and 10.0% of women, and "physical availability of samogon" - 10.3% of men and 25.0% of women.

According to the survey, one of the most popular types of unrecorded alcohol among the population is homemade wine, produced from different berries and fruits, which in the last month were consumed by 34.3% of men and 12.1% of women. One of the types of unrecorded alcohol in Belarus is counterfeit vodka, manufactured from industrial and food grade spirits. The existence of an underground alcohol market is indicated by the fact that 36.2% of men and 11.9% of women bought vodka without excise stamps "on the underground market" and 74.2% of men and 40.3% of women have bought, from a store, low-quality vodka that had an unpleasant smell and that caused symptoms of poisoning after consumption. In interpreting these data, it can be assumed that a portion of counterfeit vodka is sold through state trading enterprises. The sale of counterfeits through the official trade network discredits the quality of the licensed alcohol and strengthens the conviction of alcohol consumers that samogon is a chemically purer product than state vodka.

The results of this study indicate that 11.8% of men and 10.8% of women occasionally consume alcohol surrogates. According to respondents, the most common alcohol surrogates are medicinal tinctures with high volume of ethanol purchased in pharmacies and industrial spirits, which is bottled at home and sold under the guise of licensed alcohol. Medications with a high percentage of ethanol (tincture of Motherwort and tincture of Hawthorn) are used because they are regarded as a "pure medicinal product".

**Table 1:** Selected sample characteristics (in percentages).

| Sample characteristics | males<br>n 223  | females<br>n 103 |
|------------------------|-----------------|------------------|
| Age (years)            | $39.9 \pm 12.2$ | $43.0 \pm 13.4$  |
| Marital status         |                 |                  |
| Single                 | 56.8            | 67.2             |
| Married                | 43.2            | 32.8             |
| Education              |                 |                  |
| Primary                | 3.2             | 3.0              |
| Secondary              | 77.4            | 77.0             |
| High                   | 19.5            | 20.0             |
| Employment             |                 |                  |
| Unemployed             | 33.3            | 20.0             |
| Manual professions     | 51.8            | 58.4             |
| Nonmanual              | 8.7             | 18.5             |
| Retirees               | 6.2             | 3.1              |
| Income level           |                 |                  |
| Below average          | 43.3            | 54.5             |
| Average                | 34.8            | 30.9             |
| Above average          | 22.0            | 14.6             |

## Perceived quality of noncommercial alcohol and impact on health

The majority of men (77.4%) and substantial portion of women (59.2%) believe that samogon is a chemically pure, “natural” product, while 22.6% of men and 40.8% of women believe that samogon is a chemically “dirty” product, hazardous to health. The notion of the high quality of samogon by respondents could be formed on the basis of their personal experience because 45.7% of men and 60.8% of women noted that they have never had any health problems after consuming samogon. At the same time, 34.1% of men and 25.5% of women felt unwell, and 18.8% of men and 13.7% of women had symptoms of poisoning after consuming samogon. Contradictory data on the health consequences of the consumption of alcohol may be explained by differences in the quality of the samogon. The majority of those surveyed noted that the quality of samogon produced for personal use is significantly better than that produced for sale because in the latter case different toxic additives are often added to samogon to make it seem stronger to consumers.

## Perception of policies on noncommercial alcohol

Of interest is the expected behavior of alcohol dependent patients with a change in the affordability of alcohol. According to the results of the survey, under conditions of a lack of funds 41.6% of men and 49.2% of women will stop drinking alcohol, 25.8% of men and 22.2% of women will drink expensive high-quality alcohol beverages but in smaller amounts, while 31.6% of men and 28.6% of women will switch to cheaper alcoholic beverages. With an increase in the price for vodka, 42.0% of men and 51.9% of women report they will start to drink less alcohol, 21.8% of men and 22.2% of women will start to drink fortified wine, 13.8% of men and 20.4% of women will start to drink beer, 19.0% of men and 3.7% of women will start to drink samogon.

## Discussion

The results of this survey suggest that alcohol dependence is associated with social exclusion and marginalization. Indeed, socio-demographic correlates of alcohol dependence are similar for both sexes and include being single or divorced, being unemployed or having manual professions, having secondary education and low income level.

It appears that the self-reported total alcohol consumption was 2.0 times higher in men than in women. Although women consume significantly less alcohol than men, existing research evidence suggest that women have more alcohol-related problems at lower levels of exposure to alcohol [1]. The differences in drinking habits between genders were not limited to overall level of alcohol consumption. Our data suggest that binge drinking is more frequent among alcohol dependent men than among alcohol dependent women: 97.0% of men and 58.2% of women reported to drink an equivalent of 150 ml of vodka or more at one occasion. It should be emphasized that the harmful drinking pattern was identified as one of the major contributing factor to high alcohol-related mortality in the former Soviet republics [4,5,9].

According to the results of the survey, vodka is the product of

first choice for men and women dependent on alcohol in the Belarus sample. There is evidence that spirits preference is associated with a quicker and deeper level of intoxication, increasing the risk of alcohol-related health outcomes. In particular, [15] reported that spirit drinkers demonstrated higher severity of alcohol dependence and craving for alcohol, more frequent history of treatment for alcoholism, lower adherence to the treatment and high AST (aspartataminotransferase) and MCV (mean corpuscular volume of erythrocytes) serum levels that the beer drinkers. Also, Wilhelm et al (2008) highlighted those alcohol dependent individuals who prefer spirits have more hippocampal damage, in term of loss of volume, than beer drinkers. Fortified wines are also popular and generally consumed without meals in order to achieve a rapid intoxication effect. The popularity of fortified wines is due to their relative cheapness, as 0.5 liters of wine with strength of 18-20% costs about 2\$.

The findings from preset study showed that it was relatively common for alcohol dependent patients to drink samogon and surrogates, the most popular among which are medications with a high percentage of ethanol and industrial spirits. Samogon is the main source of noncommercial alcohol in Belarus, which is produced from sugar or grain both in homes and in remotely located mini-factories that sell to others. In 2009, 1.8 million liters of alcohol-containing liquid were seized in Belarus from illegal sales, and more than 2,000 mini-factories producing samogon were shut down [7]. In term of concentration, samogon has about of 40% ethanol, matching the alcohol content of licensed vodka. There was concern that samogon contains higher level of hepatotoxic aliphatic alcohols congeners than commercial vodka because the home producers cannot reach the degree of rectification required for vodka production alcohol [16]. Higher level of aliphatic alcohols contributes to the strong and unpleasant odor and taste of samogon. The quality of samogon produced for personal use is significantly better than that produced for sale because in the latter case different toxic additives are often added to samogon to make it seem stronger to consumers [7]. The use of poorly rectified spirits for the production of licensed vodka in Belarus resulted in a significant lowering its quality. Thus, the quality gap between samogon and licensed vodka was narrowed, contributing to popularity of samogon [7]. The pattern of samogon consumption as well as the pattern of vodka consumption is characterized by explosiveness. The social context of the use of samogon is practically no different from the context of the use of licensed vodka.

The main sources of industrial alcohol are the so-called dual use alcohol-containing liquids (household chemicals, disinfectants, window washing fluid) with an ethyl alcohol content of 70-96% by volume [7]. After homemade neutralization of the chemical additives, industrial alcohol is diluted with water, bottled and then sold. The price of the surrogate is one and one half to two times cheaper than state vodka, which explains its popularity among people who abuse alcohol. Hawthorn and Motherwort tinctures stands out as being one of the most popular of the non-beverage alcohol drunk by alcohol dependent patients. These tinctures can be obtained without a prescription at practically any pharmacy and contain at least 65% alcohol by volume. Tincture of Hawthorn is sold in 100 ml bottles for \$ 0,70 and tincture of Motherwort is sold in 50 ml bottles for \$ 0,50. It is obvious that the high availability and affordability of

industrial alcohol and medicines with high alcohol content is a main reason of its popularity among alcohol dependent persons in Belarus, since the majority of them have the monthly income below average. This situation requires an appropriate policy response including considerable enforcement efforts.

Cheapness was quoted commonly as a reason for samogon consumption [17,18]. It appears, however, that for approximately half the respondents, the main motive for consuming samogon is the belief that it is a chemically purer product than the licensed vodka. These data contradict established notions that the main motive for consuming samogon is its low price. It is obvious that the sale of counterfeit products through the official distribution network discredits the quality of licensed alcohol and strengthens the confidence of consumers of alcohol in the fact that samogon is a chemically purer product than the licensed vodka.

Accumulated research evidence suggests that affordability of alcohol is one of the most important predictors of alcohol consumption [19,20]. In relation to this it is reasonable to assume that heavy drinkers might be particularly sensitive to reduction in affordability of alcohol because they usually have a low income. The findings from this study related to alcohol control policy options suggest that alcohol dependent persons are sensitive to price changes of spirits (vodka) as the lowest-cost form of ethanol. These outcomes provide additional evidence that decreasing in affordability of alcohol is an effective strategy for reducing alcohol-related harm. It should be noted, however, that one of the objections to pricing policy as a public health strategy is that dependent drinkers are likely to switch to surrogates in the face of licensed alcohol price increase [21]. Indeed, the results from present survey suggest that the high price of legal alcohol would increase samogon drinking. Therefore, any attempt to decrease of alcohol affordability requires a degree of flexibility to tackle the problem of noncommercial alcohol.

In conclusion, this study explores types of unrecorded alcohol consumed, patterns of consumption and reasons behind unrecorded alcohol consumption among alcohol dependent patients in Belarus and provide useful information that can be used for public health interventions. The results from present study confirm that the use of unrecorded alcohol is common among alcohol dependent patients even though its use may have been underreported. Overall, alcohol dependent women consume significantly less alcohol and are less likely to manifest alcohol-related problems (binge drinking and consumption of alcohol surrogates) than men. These findings emphasize the urgency of implementing comprehensive alcohol policy, which need to address total consumption, harmful drinking pattern and taking into account the consumption of alcohol from illicit sources. Policy response should target the production and consumption of unrecorded alcohol. More specifically, holistic harm reduction strategy should include rigorous control of selling of medical alcohol, the law enforcement measures against samogon producers and counterfeiters, the initiatives to ensure the quality of licensed alcohol, the information of consumers about potential toxicities of unrecorded alcohol. In addition, arrangements need to be taken to prevent the sale of counterfeit vodka through the government trade network. It should be also emphasis that the problem of unrecorded

alcohol cannot be tackled without simultaneously taking steps to reduce the consumption of licensed beverages.

## Acknowledgements

The author would like to thank the anonymous reviewers for their valuable comments and suggestions on an earlier version of this paper.

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**Citation:** Razvodovsky YE (2015) Unrecorded Alcohol Consumption among Alcohol Dependent Patients. *J Addict Med Ther Sci* 1(1): 015-019. DOI: 10.17352/2455-3484.000005