UDK 616.895.4-056.83
613.81
COBISS.SR-ID 16466185

# FACTORS AFFECTING DEVELOPMENT OF DEPRESSION IN PEOPLE WHO DRINK ALCOHOL

*Jandric-Kocic Marijana*

HEALTH CENTER KRUPA NA UNI, REPUBLIC OF SRPSKA

**SUMMARY :** Introduction: About 90% of people consume alcohol at some point in their lives. Alcohol abuse occurs in 5-10% of these, while addiction develops in 10% of men and 3-5% of women. Alcohol consumption can induce depression or contribute to its severity. Objective: The study aimed to examine the existence of statistically significant associations between patterns of drinking alcohol, duration of alcohol use, and sociodemographic factors with depression present in persons consuming alcohol. Materials and Methods: The cross-sectional study included 100 individuals, 25.0% women and 75.0% men, with an average of 53.0 ± 1.5 years consuming alcohol over a period of eight months, from 01.10.2018. to 01.06.2019. at the Krupa Health Center on the Una. In addition to the additional tests, they also used the Audit of Identity Disorders Identification Disorders (AUDIT) test and Beck's Depression Inventory (BDI). Results: Participants with harmful alcohol drinking had a statistically significant presence of depression compared to subjects with other alcohol drinking patterns ($p < 0.05$). There was no statistically significant difference in the presence of depression in relation to the duration of alcohol use ($p = 0.09$) and the gender of subjects consuming alcohol ($p = 0.07$). Participants aged 40-59 with high school diploma who consumed alcohol had statistically significant presence of depression in relation to other good groups and the level of education ($p < 0.05$).Conclusion: The study confirmed the significant role of harmful alcohol drinking, the age and level of education in the development of depression in persons consuming alcohol.

**Keywords:** alcohol, abuse, mental health, depression

## INTRODUCTION

Alcohol consumption is a socially acceptable activity in Western Europe. In our region it is favoured to the level of an obligatory ritual in many social situations. It is estimated that about 90% of people consume alcohol at some point in their life. Alcohol abuse occurs in 5-10%, while addiction develops in 10% of men and 3-5% of women [1,2,3]. Alcohol consumption can induce depression or contribute to its severity through several potential mechanisms. Moderate doses of alcohol reduce the concentration of tryptophan, homovalinic acid, γ-amino butyric acid, N-methyl-D aspartate endogenous opioids. Its use has a negative impact on cognitive functions, contributes to feelings of inferiority, guilt and hopelessness, disrupts interpersonal relationships, and induces delinquency [4]. A primary depressive disorder in persons who consume alcohol precedes alcohol intoxication and/or alcohol withdrawal or occurs within four weeks after alcohol consumption has stopped. Between these two periods, there can only be alcohol-induced depression that is considered a consequence of abstinence syndrome and goes away spontaneously. Depression that persists after four weeks of abstinence is considered secondary [5].

## OBJECTIVE

The aim of the study was to investigate: -1): the existence of statistically significant correlation of alcohol drinking pattern with the presence of depression in alcohol drinkers, -2): the existence of statistically significant association of the duration of alcohol use with the presence of depression in alcohol drinkers,-3) : the existence of a statistically significant association of sociodemographic factors with the presence of depression in alcohol drinkers.

## MATERIAL AND METHODS

The cross-sectional study included 100 people who consumed alcohol for a period of eight months from 01.10.2018. do 01.06.2019. at the Krupa Health Center on the Una. The criteria for inclusion of the respondents in the study were: age between 20 and 79 years, completed

primary school and anamnestic data on alcohol consumption for at least twelve months. The study excluded persons: over the age of 79 and under 20 with alcohol consumption of less than twelve months, as well as all persons with malignant and advanced chronic diseases (chronic renal failure, heart decompensating, liver failure). Data were collected through the use of general and specific questionnaires. The general questionnaire collected sociodemographic data (gender and age, level of education). Beck's Depression Inventory (BDI) is used as an indicator of the existence and intensity of depressive symptoms that are in accordance with the current Diagnostic and Statistical Manual of Mental Disorders (DSM). Today, another revised version recommended by the American Psychiatric Association (APA) is in use. It consists of 21 statements (each statement is a list of four statements ranked according to the intensity of a particular symptom of depression) that we score from 0 to 3. A total score of 0 to 13 excludes the existence of depression. The results in the interval of 14 to 19 speak in favour of mild depression. There is moderate depression in the score 20-28. Severe depression is present in patients who have a score of 29-63 [6,7]. The Alcohol Use Disorders Identification Test (AUDIT) is intended for the early identification of risky and harmful drinking as well as alcohol dependence, developed and recommended by the World Health Organization (WHO). The test consists of three questions in the area of risky alcohol use (frequency of drinking, typical amount, frequency of heavy drinking), three questions covering the symptoms of addiction (diminished control over drinking, increased drinking desire, morning drinking) and four questions in the area of harmful alcohol use (guilt after drinking, amnesia, alcohol-related injuries, environmental concerns), which we score 0-4. Score 0-7 is in favour of low-risk drinking. The result in the interval 8-15 corresponds to risky drinking. Harmful drinking is present in subjects with a score of 16-19. The score 20-40 reveals alcohol abuse [1,8]. Descriptive statistical methods were used to analyse the data: abundance frequency distribution, arithmetic mean, standard deviation, and percentages. To determine statistical significance the $\chi 2$-independence test was used. The significance level was set at 95% confidence interval. The results are presented textually, in tabular form and graphically, and the complete work is processed in Microsoft Word for Windows text processor.

## RESULTS

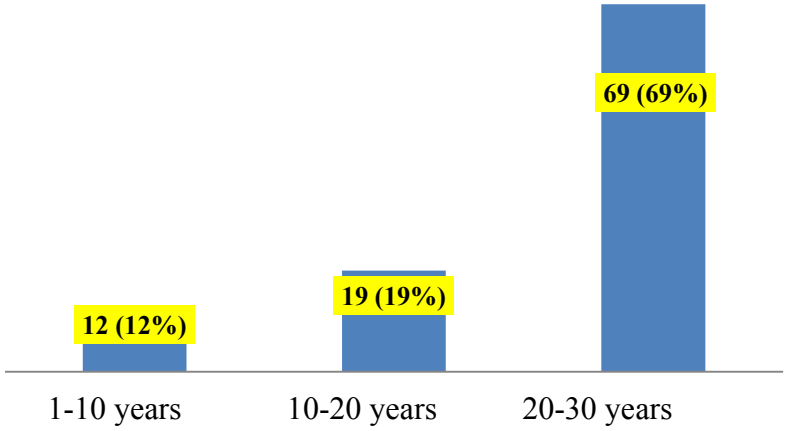
The study included 100 patients. Among them, 25.0% were women and 75.0% were men. The majority of respondents who consume alcohol (58%) are 40-59 years of age. The average age of the study population was 53.0 ± 1.5 years. Women were statistically significantly older than men. 22% of respondents had completed primary school, 2% had college education. High school graduation rate was 76%.

Table 1. Distribution of alcohol drinkers by gender, age and education level

| Age (years) | MenNo (%) | WomenNo (%) | TotalNo (%) |
|---|---|---|---|
| 20-39 | 10 (10,0%) | 0 (0,0%) | 10 (10,0%) |
| 40-59 | 58 (58,0%) | 16 (16,0%) | 74 (74,0%) |
| 60-79 | 7 (7,0%) | 9 (9,0%) | 16 (16,0%) |
| TotalNo (%) | 75 (75,0%) | 25 (25,0%) | 100 (100,0%) |
| Level of education | MenNo (%) | WomenNo (%) | TotalNo (%) |
| Primary school | 12 (12,0%) | 10 (10.0%) | 22 (22,0%) |
| High school | 61 (61,0%) | 15 (15,0%) | 76 (76,0%) |
| College | 2 (2,0%) | 0 (0,0%) | 2 (2,0%) |
| TotalNo (%) | 75 (75,0%) | 25 (25,0%) | 100 (100,0%) |

Most participants (69%) consumed alcohol for 20-30 years. The second most frequent were respondents (19%) who consumed alcohol for a period of 10-20 years. The smallest number of study participants (12%) consumed alcohol for 1-10 years.

Graph 1. Length of drinking alcohol in years of participants
N = 100




The highest number of respondents (49%) identified risky drinking. Low-risk drinking was verified in 35% of respondents, harmful drinking in 13%. The smallest number of respondents reported alcohol abuse (3%). Male respondents, 40-59 year old with high school diploma as well as alcohol drinkers for 20-30 years had a statistically significantly higher percentage of risky and harmful drinking as well as alcohol dependence.

Table 2. Distribution of gender, age and education level of alcohol drinkers by AUDIT (alcohol use disorders identification test)

| Characteristics | | Score 0-7** | Score 8-15*** | Score 16-19**** | Score ≥20***** | p value* |
|---|---|---|---|---|---|---|
| **Gender** | Men | 19 (25,3%) | 43 (57,4%) | 10 (13,3%) | 3 (4,0%) | NS, 0.07 |
| | Women | 16 (64,0%) | 6 (24,0%) | 3 (12,0%) | 0 (0,0%) | |
| **Age in years** | 20-39 years of age | 1 (10,0%) | 7 (70,0%) | 2 (20,0%) | 0 (0,0%) | < 0.05 |
| | 40-59 years of age | 20 (27,0%) | 40 (54,1%) | 11 (14,9%) | 3 (4,0%) | |
| | 60-79 years of age | 14 (87,5%) | 2 (12,5%) | 0 (0,0%) | 0 (0,0%) | |
| **Education level** | Primary school | 13 (59.1%) | 6 (27,3%) | 3 (13,6%) | 0 (0,0%) | < 0.05 |
| | High school | 22 (28,9%) | 41 (53,9%) | 10 (13,2%) | 3(4,0%) | |
| | College | 0 (0,0%) | 2 (100,0%) | 0 (0,0%) | 0 (0,0%) | |
| **Length of drinking alcoholin years** | 1-10 years | 1 (8,3%) | 10 (83,4%) | 1 (8,3%) | 0 (0,0%) | < 0.05 |
| | 10-20 years | 10 (52,6%) | 9 (47,4%) | 0 (0,0%) | 0 (0,0%) | |
| | 20-30 years | 24 (34,8%) | 30 (43,4%) | 12 (17,4%) | 3 (4,3%) | |

LEGEND:*According to hi square test or Fisher test; **Low-risk drinking; ***Risky drinking; **** Harmful drinking; *****Alcohol abuse.

Depression was reported in 42 (46.0%) men and 15 (60.0%) women. 6 (8.0%) men and 8 (32.0%) women had moderate depression. Severe depressive disorders were verified in 3 (4.0%) men and 1 (4.0%) woman. The study could not detect a statistically significant difference in the presence of depression in relation to the gender of alcohol-consuming subjects (p = 0.07). Depression was present in 4 (40.0%) subjects aged 20-39 years, 49 (66.2%) subjects aged 40-59 years and 4 (25.0%) subjects aged 60-79 years. Moderate depressive disorders were experienced by 1 (10.0%) subject aged 20-39 years, 12 (16.2%) subjects aged 40-59 years and

1 (6.2%) subject aged 60-79 years. Severe depressive disorders were found in 4 (5.4%) persons aged 40-59 years. Presence of depression in subjects 40-59 years of age who consumed alcohol was statistically significantly more frequent than in subjects of other age groups (p <0.05). Depression problems were experienced by 12 (44.5%) respondents with completed primary education and 43 (46.6%) respondents with completed secondary education. Moderate depression was found in 3 (13.6%) subjects with completed primary education and 11 (14.5%) subjects with completed secondary education. Severe depressive disorders were verified in 4 (5.3%) of high school graduates. Participants in the study who consumed alcohol with high school diploma had presence of depression statistically significantly more frequent compared to respondents with other levels of education (p <0.05). Depression was found in 8 (66.7%) subjects who consumed alcohol for 1-10 years, 14 (95.0%) subjects who consumed alcohol for 10-20 years, and 35 (50.7%) subjects who consumed alcohol for 20-30 years. Moderate depressive disorders were experienced by 3 (25.0%) subjects who consumed alcohol for 1-10 years, 7 (7.0%) subjects who consumed alcohol for 10-20 years, and 4 (5.8%) subjects who consumed alcohol for 20- 30 years. Severe depressive disorders were verified in 4 (4.0%) subjects who consumed alcohol for 10-20 years. There was no statistically significant difference in the presence of depression in alcohol drinkers with respect to the duration of alcohol consumption (p = 0.09).

Depression was verified in 13 (37.1%) subjects with low-risk drinking, 28 (47.1%) subjects with risky drinking, and all (100%) subjects with harmful drinking and alcohol abuse. Moderate depression was experienced by 4 (8.2%) subjects with risky drinking and 10 (76.9%) by subjects with harmful drinking. Severe depressive disorders were identified in 1 (7.7%) subject with harmful drinking and 3 (100.0%) subjects with alcohol abuse. Respondents with harmful drinking had presence of depression statistically significantly more frequent than subjects with other drinking patterns (p <0.05).

Table 3. Distribution of sociodemographic characteristics, length of drinking alcohol and drinking patterns of alcohol drinkers by BDI (Beck's Depression Inventory)

| **Characteristics** | | **Score 0-13**** | **Score 14-19***** | **Score 20-28****** | **Score ≥29******* | **p value*** |
|---|---|---|---|---|---|---|
| **Gender** | Men | 33 (44,0%) | 33 (44,0%) | 6 (8.0%) | 3 (4.0%) | NS, 0.07 |
| | Women | 10(40,0%) | 6 (24,0%) | 8 (32,0%) | 1 (4,0%) | |
| **Age in years** | 20-39 years of age | 6 (60,0%) | 3 (30,0%) | 1 (10,0%) | 0(0,0%) | < 0.05 |
| | 40-59 years of age | 25 (33,8%) | 33 (44,6%) | 12 (16,2%) | 4 (5,4%) | |
| | 60-79 years of age | 12 (75,0%) | 3 (18,8%) | 1 (6.2%) | 0(0,0%) | |
| **Education level** | Primary school | 10(45,5%) | 9 (40,9%) | 3 (13,6%) | 0(0,0%) | < 0.05 |
| | High school | 33 (43,4%) | 28 (36,8%) | 11 (14,5%) | 4 (5,3%) | |
| | College | 0(0,0%) | 2 (100,0%) | 0(0,0%) | 0(0,0%) | |
| **Length of drinking alcoholin years** | 1-10 years | 4 (33,3%) | 5 (41,7%) | 3 (25,0%) | 0(0,0%) | NS, 0.09 |
| | 10-20 years | 5 (5,0%) | 3 (3,0%) | 7 (7,0%) | 4 (4,0%) | |
| | 20-30 years | 34 (49,3%) | 31 (44,9%) | 4 (5,8%) | 0(0,0%) | |
| **Alcohol drinking pattern** | Low-risk drinking | 22 (62,9%) | 13 (37,1%) | 0(0,0%) | 0(0,0%) | < 0.05 |
| | Risky drinking | 21 (42,9%) | 24 (49,0%) | 4 (8,2%) | 0(0,0%) | |
| | Harmful drinking | 0(0,0%) | 2 (15,4%) | 10(76,9%) | 1 (7,7%) | |
| | Alcohol abuse | 0(0,0%) | 0(0,0%) | 0(0,0%) | 3 (100,0%) | |

LEGEND:*According to hi square test or Fisher test; ** Absence of depression problems; *** Mild depression problems ; **** Moderate depression problems ; ***** Severe depression problems;

## DISCUSSION

The study found that depression was present in 64% of people who consumed alcohol (39% mild depression, 14% moderate depression, and 4% severe depression). In a study by a group of authors in Kenya, secondary depression was present in 68.3% of alcohol drinkers [9]. Studies conducted in England have verified the existence of moderate depression in 47% of people diagnosed with alcoholism. Severe depressive disorders were reported by 34% of people consuming alcohol [1]. A study by a group of authors in Nepal found that there was depression in 41.7% of people hospitalized for alcohol abuse [10]. The study did not verify a statistically significant difference in the presence of depression compared to the gender of alcohol drinkers. Research by a group of authors from the Netherlands has concluded that women who consume alcohol have a statistically significantly higher risk of secondary depression [11]. Research by an author group in Taiwan and the United States has found a strong correlation between alcohol use and depression in upper elementary school students. Alcohol use in the early adolescent period results in changes in the frontal and limbic cortex responsible for affective damage [12,13]. Studies conducted in Russia have found that alcohol consumption in women is associated with a faster development of depression than in men. A possible reason is that women achieve higher levels of alcohol in their blood than men after drinking equivalent amounts of alcohol per kilogram of body weight [14,15]. In addition, women are at greater risk of developing depression as a result of gender differences in roles in contemporary society [16]. The age of 40-59 years was associated with statistically significantly more frequent presence of depression in alcohol drinkers. At that age, there may be an increased alcohol consumption in an attempt to cope with growing socioeconomic problems. Research by a group of American authors indicates that people who start consuming alcohol in older adulthood have a statistically significantly bigger chance of experiencing depression than their non-drinking peers [4]. Participants in the study with high school diploma who consumed alcohol had presence of depression which was statistically significantly more frequent compared to respondents with completed primary school and university-educated persons. The more frequent presence of depression can be explained by significantly more frequent occurrence of harmful drinking and alcohol abuse in the same respondents. The duration of alcohol consumption did not statistically significantly influence the development of depression. Studies indicate that alcohol use leads to the development of depression quite early. Research in the United States indicates that over 28% of people who consume alcohol have developed depression by the age of 30 [17]. The pattern of alcohol consumption is closely related to the onset of depression in study participants. A study by a group of US authors indicates that men who drink 14-27 alcoholic beverages per week and women who drink 7-13 alcoholic beverages per week have a statistically significantly higher presence of depression than those who drink less alcohol [3]. Research conducted in Singapore has identified alcohol dependence as an independent predictive factor for the development of depressive disorders in female subjects [18]. Research conducted in Australia found a statistically significant association between alcohol abuse and the development of depression in young women [19,20]. A study conducted in China found that low-risk drinking significantly reduced the risk of depression in both sexes [21]. A study by a group of US authors found significantly fewer depression problems in the elderly with low-risk alcohol consumption (they had a statistically significantly lower C reactive protein concentration) [22]. Research by a group of authors in Spain has not found a protective effect of moderate alcohol consumption on the development of depression in the elderly [23].

## CONCLUSION

Harmful drinking is a strong predictor of the presence of depression. The duration of alcohol use was not statistically significantly associated with the presence of depression. There is no statistically significant difference in the presence of depression in relation to the gender of alcohol drinkers. 40-59 years of age and secondary education were associated with the presence of depression in people consuming alcohol.

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