

ALCOHOL CONSUMPTION HABITS AND SLEEP QUALITY

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Alcohol is the most widely used psychoactive substance, due to its easy production, availability of alcoholic beverages and fast action. Drinking alcohol can cause sleep disorders because it disrupts the sequence and duration of sleep stage. The aim of this study was to examine the influence of alcohol consumption on the quality and length of sleep of the first year students of doctoral studies at the Faculty of Medicine.

Our study group included 42 patients who were in the first year of doctoral studies at the Faculty of Medicine in Niš. The research was conducted from November 2011 until April 2012 at the Faculty of Medicine. Out of the 42 subjects who were included in the research, 25 of them or 59.5% consumed alcohol, while 17 of them or 45% did not. Comparing the length of sleep of those who consumed alcohol with those who did not, the difference was not statistically significant.

Alcohol consumption leads to poor quality of sleep, but it does not affect the length of sleep. *Acta Medica Medianae 2014;53(2):10-15.*

Key words: alcoholic drink, sleep, sleep quality

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Introduction

Alcohol (ethyl alcohol - ethanol) is a volatile, flammable, clear, colorless liquid with a characteristic odor and taste. Ethyl alcohol is obtained by decomposition of glucose and natural fermentation of monosaccharides under the effect of enzymes that generate yeasts *Sacharomyces*.

Alcohol is the most widely used psychoactive substance. That contributes to its easy production, availability, and quick action. People often think that one or two drinks can improve sleep quality, since this will make them to fall asleep earlier, but the truth is quite the opposite (1).

Alcoholism is one of the three biggest addiction as cigarettes and drugs. The World Health Organization in 1952 defined alcoholism as a disease, and according to this definition "Alcoholism is any form of drinking which in its extent goes beyond the traditional and customary dietary use or ordinary compliance with the social drinking customs of the whole community concerned, irrespective of the etiological factors leading to such behavior and irrespective also of the extent to which such etiological factors are dependent upon heredity, constitution, or acquired physiopathological and metabolic influences. "It took centuries

to understand that alcoholism is not a bad habit but serious psychiatric and social disease (2).

The definition of an alcoholic by the World Health Organization is: "Alcoholics are those excessive drinkers whose dependence upon alcohol has attained such a degree that it shows a noticeable mental disturbance or an interference with their bodily and mental health, their interpersonal relations, and their smooth social and economic functioning; or who show the prodromal signs of such development. They therefore require treatment."

Today, there are many definitions of alcoholism, but the opinion prevails that a strict definition cannot be given because alcoholism is caused by multiple factors; it is a multi-dimensional biological-psychosocial disorder that occurs on the basis of numerous interactions between individual factors (biological and psychological) and environmental factors (psychological, social, cultural, economic, etc.), which are often difficult to identify and determine in the development of alcoholism (1,3).

Today, there are two interesting attitudes about alcoholism. One is liberal towards drinking and drunkenness and alcoholism, while the other condemns alcoholism and promotes the so-called "normal drinking"- socially acceptable drinking, which is in the so-called normal range. Causes of youth alcoholism are different. Picks show their value and maturity. At puberty there is a tendency to set free from the influence of the elderly, which can lead to more frequent use of alcoholic beverages. During adolescence, there is increased consumption of alcoholic beverages which should

help solving the problems. Alcohol harms the health of the young and prevents its normal psychological and physical development. Early occurrence of organic and autonomic disorders is frequently seen. Alcohol leads to gastrointestinal disorders, liver damage (cirrhosis), pancreas damage, heart damage, damage to the peripheral nervous system, reduced potency of eye, toxic damage to the lungs and kidneys, the development of fetal alcohol syndrome, and there is a general physical deterioration (4).

Sleep is brain activity that is defined as a state of unconsciousness from which a person can be aroused by sensory or other stimuli.

Sleep can be divided into two types:

1. Slow-wave sleep
2. REM sleep (sleep with rapid eye movements).

The function of sleep is not well understood, although a lot of evidence shows that sleep deprivation can have serious consequences, including increased risk of depressive disorders, respiratory diseases, and heart disease.

Excessive daytime sleepiness results from sleep disorder which is associated with memory deficits, impaired social and occupational function (5,6).

The reported associations between alcohol use and sleep problems can be explained, at least in part, by the pharmacologic effects of alcohol. This effect seems to be dose-related (7). At low to moderate doses, alcohol can have a stimulating effect that might lead to problems with falling asleep, usually during the first hour after its use (7, 8). At high doses, alcohol has a sedating effect (9-12).

Yet, the sedative effect of alcohol wears off quickly and is followed by sleep disruptions, especially during the second half of the night (7, 8, 10, 13). During the first part of the sleep cycle, the body adjusts to the presence of alcohol in an effort to maintain a normal sleep pattern. Once alcohol has been eliminated from the body, however, certain physiological variables, such as REM-sleep patterns, change in the opposite direction of the body adjustments induced by alcohol. These changes result in sleep disruptions (10). Studies find that, after about a week of repeated nightly alcohol use, the sedative effect of alcohol diminishes, while its sleep disturbing effect remains (7,10,14).

Some studies report that tolerance to alcohol sedative effect can develop after only three nights (15).

The association between alcohol use and sleep problems, however, might be due to more than the pharmacologic effects of alcohol. Besides causing sleep problems, the use and misuse of alcohol could also be a reaction to sleep disturbances. Alcohol is commonly perceived to aid sleep, and many individuals drink alcohol to self-treat insomnia (16,17). Sleep problems might be early indicators of increased risk for substance use (18).

Moreover, sleep disturbances seem to be an important cause of relapse in alcohol-dependent patients (19).

Person during sleep goes through two alternating stages of sleep, which is characterized by various types of brain electrical activity. Most of the sleep is deep, quiet, slow-wave sleep. REM sleep occurs periodically, occupying about 25% of sleep time in adults. Episodes of REM sleep occur in normal nocturnal sleep in duration of 5 to 30 minutes and repeat every 90 minutes. REM sleep is usually associated with dreams. Although its function is unknown, it appears that REM sleep is essential to health. In rats, REM sleep deprivation can lead to death within a few weeks (20).

Drinking alcohol can cause sleep disorders by disrupting the sequence and duration of sleep, and the time it takes to fall asleep. Earlier decades ago, the National Institute of Health recognized the adults (18 to 25 years old) as the population which is more sensitive to sleepiness and its related consequences (10,21).

In line with previous research, the use of alcohol was associated with the expected negative consequences related to alcohol. As there is a link between sleep problems and risky behavior, bad global sleep quality was predictably associated with the effects of alcohol. Finally, the relationship between alcohol consumption and effect is supposed to be the strongest among individuals who reported the loss of global sleep quality.

Aims

The aim of this study was to examine the effect of alcohol consumption on the quality and length of sleep in the first year students of doctoral studies at the Faculty of Medicine.

Examinees and methods

This study aimed to investigate the connection between the global sleep quality and duration of sleep, alcohol consumption and consequences of alcohol consumption in the sample which primarily consisted of the first-year students of postgraduate studies. Global sleep quality assessed two indicators of sleep: subjective sleep quality and length of sleep. All data were obtained through an anonymous survey, using a questionnaire defined.

Pittsburg Sleep Quality Index PSQI was used to create an anonymous survey (22).

Respondents were acquainted with the plan and method of research. All students who were offered testing voluntarily agreed to participate.

Sleep quality was analyzed using the mentioned questionnaire in which subjects' sleep quality was determined based on numerical classification from 1 to 5, where 1 denotes poor quality of sleep, 2-unsatisfactory quality of sleep, 3-good quality of sleep, 4- satisfactory and 5- excellent quality of sleep.

Length of sleep was defined on the basis of survey responses about the average length of daily sleep, and calculations of the length of daily episodes of sleep. The average length of sleep is shown in hours.

Behavior of subjects related to alcohol consumption were analyzed based on the frequency and types of alcoholic beverages consumed. The frequency was evaluated on the basis of: one drink per week, 2-3 drinks per week, everyday drinking. The kind of drink was analyzed in the following categories: hard liquor, beer and wine.

The polling was conducted at the end of the school year 2010/2011, at the Faculty of Medicine, University of Nis, Serbia, and it included 42 students. The mean age of participants was 29.19 (SD=5.94) years, and they were at the first year of doctoral studies. Of 42 respondents, 25 (59.5%) were females and 17 (40.5%) were men. Most of the participants, 82.4% of them, lived outside the dorm, and only 12% lived in the dorms. Among those who live outside the dorm, 6.5% lived with the family, 73.5% lived alone and 20% were married.

Eighty percent of the students involved in the study were medical doctors (MDs), 10% were pharmacists and 10% were dentists. Students who were selected to participate in this study received an email containing a study description and a blank questionnaire. They had one week to complete the questionnaire at home and send them back by email.

Respondents were given the questionnaire which consisted of three parts: general data, completing undergraduate studies, socioeconomic status. Socioeconomic status consisted of 47 questions, including questions about alcohol consumption, frequency of alcohol consumption, type of alcoholic drink, sleep quality and duration of sleep.

Statistical analysis was performed using appropriate statistical tests. The methods of descriptive statistics used relative numbers, percentages and measures of central tendency and measures of variability (mean, standard deviation).

The Student's t-test for was applied to compare the values between groups in relation to alcohol consumption. Data analysis was conducted using SPSS.

Results

Of 42 patients who were included in the study, 25 of them or 59.5% consumed alcohol, whereas 17 of them or 45% did not.

Sleep quality was graded from 1 to 5, where 1 is poor quality sleep, and 5 the best quality of sleep. In the group of patients who consumed alcohol there was a similar percentage of those who had bad quality of sleep as in the group of respondents who did not consume alcohol (Table 1).

The most frequent grade for sleep quality in those who did not drink alcohol and those who consumed it was 4 (48% and 52.9%, respectively). Data are presented as n/%, 1-poor quality of sleep, 2-unsatisfactory quality of sleep, 3-good quality of sleep, 4-satisfactory quality of sleep, 5-excellent quality of sleep, NS for all parameters.

Comparing the length of sleep among those who drank and did not drink, a statistically significant difference in the length of sleep was not found (7.4 vs. 7.8; $t=1.050$, $p=0.300$) (Table 2).

In the group of respondents who consume alcohol, the majority of respondents consumed alcohol once a week, then twice a week, followed by those who drank alcohol five times per week. Data are shown in Figure 1.

The most common types of alcohol in respondents who consume alcohol are hard liquor, followed by beer and wine (Figure 2).

By using the correlation analysis, the results indicate that there is no statistically significant correlation between alcohol consumption and sleep quality ($r=-0,059$; $p=0,712$).

Correlation analysis of the obtained results indicate that there is no statistically significant correlation between the type of drink and sleep quality ($r= 0,011$; $p=0,958$).

Table 1. Alcohol consumption and sleep quality

		Do not drink		Drink		Total	
		n	%	n	%	n	%
Sleep quality	1	0	0	0	0	0	0
	2	3	12	1	5,9	4	9,5
	3	3	12	2	11,8	5	11,9
	4	12	48	9	52,9	21	50
	5	7	28	5	29,4	12	28,6

Table 2. Comparing the length of sleep among those who drank and did not drink

	Respondents who drank	Respondents who didn't drink
Length of sleep	7,4±1,28	7,8±1,1

Data are presented as mean \pm SD, $t = 1.05$, $p = 0.30$

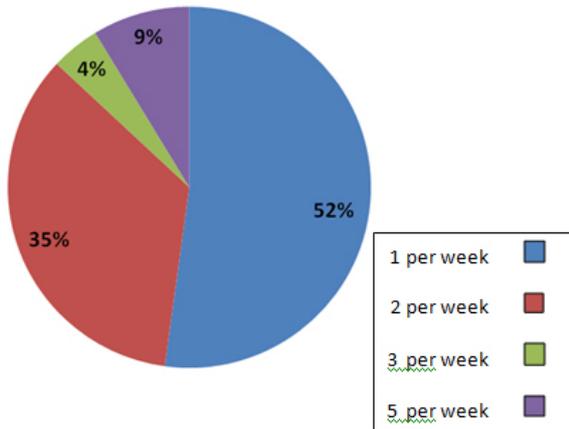


Figure 1 The frequency of alcohol consumption in respondents

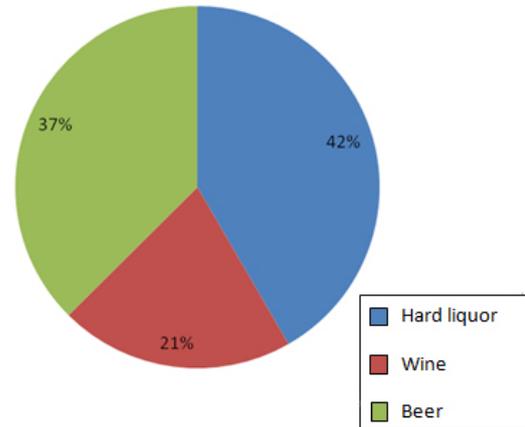


Figure 2. Type of drinks

Discussion

The results obtained in this study indicate that frequent alcohol consumption is associated with poor quality of sleep.

Drinking alcohol before bedtime, after an initial stimulating effect, can reduce the time it takes to fall asleep. Due to the sedative effects of alcohol, many people with insomnia consume it to help them fall asleep. However, consumption of alcohol within one hour before bedtime leads to disturbances in the second half of the sleep period (13).

Continued drinking alcohol before bedtime decreases "alcohol induced sleep" effect, while disruptive effects of alcohol continue or increase (23).

The negative effects of sleep deprivation increased after consuming alcohol. Decreased alertness or poor quality of sleep can potentially increase the sedative effect of alcohol in situations rotating scheduled sleep and wakefulness due to fast travel to different time zones (24).

In our study, the most frequent type of drinks respondents consume are spirits which contain a high percentage of alcohol, which further supports the results that patients who consume alcohol do that because of its sedative effects and not because of sleep quality.

In studies dealing with alcohol and sleeping it has been proven that alcohol clearly increases slow-wave sleep (SWS) in the first half of sleep regardless of the dose of alcohol. Slow-wave sleep during the night depends on the dose of alcohol that is consumed, so

that small doses of alcohol have a clear impact, while high doses of alcohol show a clear and significant effect on the increase in total slow-wave sleep during the night (25-27).

Insufficient sleep may increase alcohol risk among at-risk drinkers through its depletion of cognitive functioning (18,28).

While heavier drinkers already face cognitive impairment and increased risk, they are deprived of quality sleep and healthy sleep function, which may be the cause of making wrong decisions. In contrast, lighter drinkers, even if deprived of quality sleep, may have less compromised cognitive functioning when drinking. Further, heavier drinkers may drink late into the night when risks escalate and may suffer consequences the following day due to poorer global sleep quality and/or early daily obligations [e.g., „going to work or school high or drunk” or “missing a day (or part of a day) of school or work”] (18,28).

The impact of alcohol on REM sleep is reflected in the reduction of the percentage of REM sleep during the night. Reduction of total REM sleep during the night shows a clear dose dependency and direct effect of alcohol on REM sleep (29).

Conclusion

Most often students drink alcohol once a week, usually hard liquor. Length of sleep is roughly similar for all doctoral students, irrespective of alcohol consumption.

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NAVIKE KONZUMIRANJA ALKOHOLA I KVALITET SNA

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Alkohol je najrasprostranjenija psihoaktivna supstanca zbog lake proizvodnje, dostupnosti alkoholnih pića i brzog delovanja. Konzumiranje alkohola može izazvati poremećaje sna zato što remeti redosled i trajanje stadijuma spavanja.

Cilj ovog rada bio je da se ispita uticaj konzumiranja alkohola na kvalitet i dužinu sna kod studenata prve godine doktorskih akademskih studija na Medicinskom fakultetu u Nišu.

Ispitivanu grupu činila su 42 ispitanika na prvoj godini doktorskih akademskih studija Medicinskog fakulteta u Nišu. Istraživanje je trajalo od novembra 2011. godine do aprila 2012. godine na Medicinskom fakultetu u Nišu.

Od 42 ispitanika koji su bili uključeni u istraživanje, njih 25 ili 59,5% konzumiralo je alkohol, dok njih 17 ili 45% to nije činilo. Poređenjem dužine sna onih koji piju i onih koji ne piju alkohol ne uočavamo statistički signifikantnu razliku u dužini sna.

Konzumiranje alkoholnih pića dovodi do lošeg kvaliteta sna, ali ne utiče na dužinu sna. *Acta Medica Medianae 2014;53(2):10-15.*

Ključne reči: *alkoholna pića, spavanje, kvalitet sna*