Title of paper: Public Health Care-Related Importance of Alcohol Poisoning in Area of Bugojno

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Abstract

Introduction: Many researches, which have been conducted in last twenty years in the world and in our country, have indicated the connection of alcoholism with numerous health-related and social problems, violence in family and society and large number of traffic accidents and other traumatism with negative consequences. Nowadays, alcohol is considered as socio-medical disease and it represents one of the most serious public health care-related problems. The addiction to alcohol itself is considered as disease only during last fifty years. According to the assessment by World Health Organization, 2 billion people in the world consume alcoholic drinks nowadays, and 76,3 million people have problem with excessive alcohol consumption.

Research goals: Establish total number of registered cases of alcohol poisoning in the area of Bugojno during research period; Establish how many senior students in high school are aware of public health care-related problem of alcohol; Establish whether alcohol is the most common reason of acute poisoning in relation to other poisonings registered in Emergency Medical Care Department Bugojno.

Patients and methods: This research is retrospective cross-sectional study based on perception. The patients diagnosed with acute alcohol poisoning who requested and were offered help in Emergency Medical Care Department Bugojno in three-year period from 01.01.2012 to 01.01.2015 are included in the research. The data used are obtained by processing working protocols in Emergency Medical Care Department Bugojno. Randomly selected students filled in survey questionnaire, in Secondary Technical School in Bugojno and the survey results are statistically processed. The survey included 100 senior students.

Results of research: This research in three-year period included 450 patients, in 2012 – 133 patients, in 2013 – 175 patients, in 2014 – 142 patients. The men are more represented – 75% in relation to women – 25%, ratio: 3:1, Much larger number of patients living in cities – 80% was expected than in village – 20%. The survey included 100 students, 64 (64%) of them are male students and 36 (36%) are female students.

Conclusion: Public health care-related problems and their consequences are solved in various ways, but the best solution is to prevent their occurrence. Children and young people are the most vulnerable part of population when it comes to alcohol. Preventive activities should be directed to the overall population of young people, and especially to groups of young people with risky behaviors. The results of survey questionnaire show that it is necessary to educate young people about harmful effects of alcohol.

Key words: area of Bugojno, alcohol addiction, drinking,, emergency medical care, intoxication, stances on alcoholism among students, youth education

1. INTRODUCTION

Through history, all peoples, and at all levels of human population development, have used alcoholic drinks as means for getting drunk, enjoyment and other purposes. If taken in small quantities, the alcohol stimulates, in human organism, secretion by digestive system organs, makes reflexes sluggish and reduces functional capacities of brain cells. Long-term intake of alcohol in large quantities often leads to damage of all organs, and to disorders of all human body functions. Alcoholics often suffer from depression and anxiety; they are more prone to infections due to reduced immune resistance [1]. Alcoholism is a serious illness. It is alcohol poisoning, depending on individual tolerance of alcoholic drinks. Nowadays, the alcoholism is considered to be a disease that needs to be treated, and its roots are, genuinely, genetic ones [2]. Numerous studies, conducted over the last twenty years in the world and in our country, have shown the connection of alcoholism with many health and social problems, violence in family and society and large number of traffic accidents and other traumatisms with negative consequences [1]. Alcohol is the most spread and the most accessible psychoactive substance, the abuse of which is socially accepted [3]. Today, alcoholism is considered as socio-medical disease and it represents one of the most serious public health problems. Regardless of personality, long-term excessive consumption of alcoholic drinks may lead to chronic alcoholism [4]. By the number of diagnosed cases, alcoholism, as disease, is at the third place just behind heart and blood vessels diseases and malignant tumors. The number of alcoholics in most countries increases, and it may be approximately estimated by monitoring the consumption of alcoholic drinks, by registering number of deaths due to alcoholism or number of organ damages caused by use of alcoholic drinks [5]. According to World Health Organization estimates, in the world, today, there are about 2 billion people consuming alcoholic drinks and 76,3 million people who have problem with excessive alcohol consumption [6]. In small doses, ethanol is a socially accepted anxiolytics, while in high doses, it is poisonous and may lead to respiratory depression and death. Ethanol poisoning has a special socio-medical importance due to developing addiction and tolerance to ethanol. Ethanol is also important because it potentiates toxicity of other numerous organic solvents [7]. The alcohol addiction is a serious mental disorder since it leads to pathological processes which change the way the brain works. Long-term alcoholism causes a number of serious health problems such as liver cirrhosis, alcoholpoisoning, heart diseases, kidney diseases, as well as whole series of psychological and social disorders. Starting to drink early is connected to higher risk of developing the addiction. Thus, if children start to drink at 13 years of age, 43% of them will develop addiction until adulthood. If they start to drink in adulthood, only 10% will develop addiction. There is an indication that drinking alcohol makes it difficult for young people to follow the teaching process, i.e. learning and memory, thus it is important to take preventive action on suppressing drinking alcoholic drinks and because of possible educational deficits [8].

- ## 2. GOALS AND TASKS OF RESEARCH

1. Determine the total number of reported alcohol poisoning cases in the area of Bugojno in the research period;

2. Determine to what extent the secondary school final years students are familiar with public health problem related to alcohol;

3. Determine whether alcohol is the most common reason of acute poisoning in relation to other types of poisoning registered in Emergency Medical Care Department in Bugojno.

- **3. SUBJECTS AND METHODS OF RESEARCH**

- Subjects

These are the patients who have been diagnosed with acute alcohol poisoning and who asked for and were offered help in Emergency Medical Care Department in Bugojno in the period from 01.01.2012 to 01.01.2015. There was a total of 450 patients. The research of the problem related to alcohol was conducted also by means of survey questionnaire, by random selection, 100 students were surveyed in Secondary Technical School Bugojno in Bugojno.

- Methods of research

This research is retrospective cross-sectional research based on perception. The used data are obtained by processing the working protocols of patients in Emergency Medical Care Department Bugojno and by processing the survey on problem with alcohol in Secondary Technical School. The data collected was used for statistical processing and data analysis. The data are grouped by tables and graphics as per research goals.

- Survey

The survey consists of 20 questions where students will talk about the issue of alcoholism, stance of youth on public health problem of alcohol and better information on harmful effects of alcohol. The survey is made for this occasion and has anonymous character.

- Statistical data processing

At the end of survey, statistical data processing was performed. For the statistical analysis of obtained data, we used computer program package IBM SPSS Statistics 20 and Microsoft Excel, where the data were prepared and processed. The χ^2 test was used in statistical analysis.

- **4. RESEARCH RESULTS**
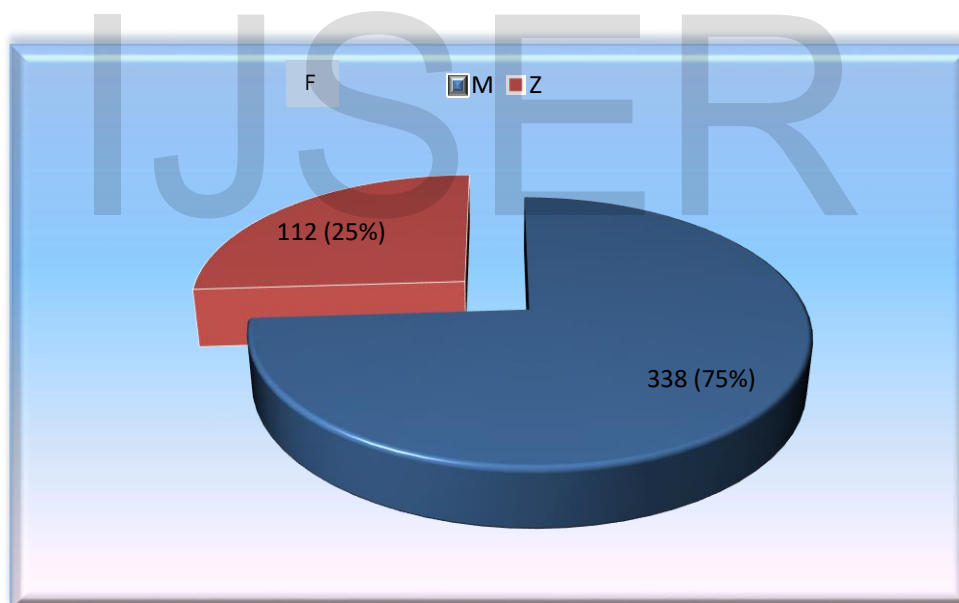
Graph no. 1 Total number of patients poisoned with alcohol by gender

The number of patients in all three years when it comes to the gender structure is such that there is a larger number of men than women. A total of 338 (75%) of men and 112 (25%) of women were poisoned by alcohol, which is 3:1 ratio. In this relation, the number of male gender subjects is dominant.
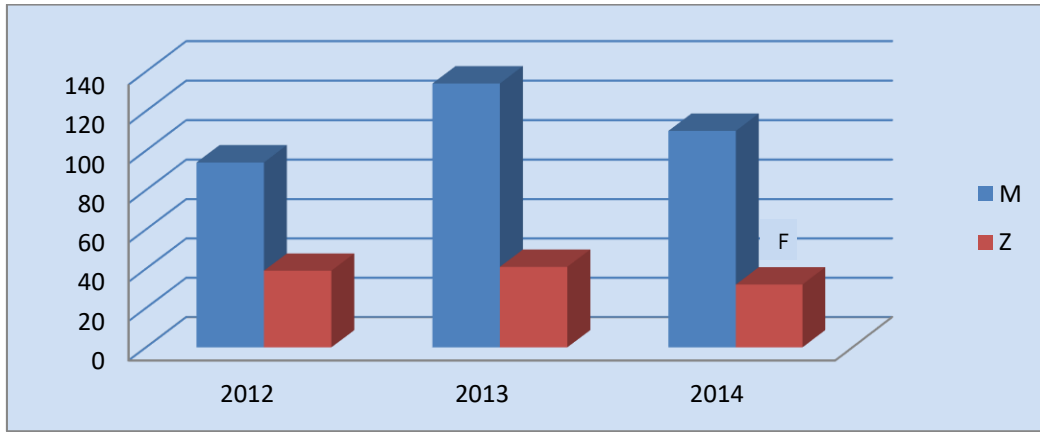
Graph no. 2 Overview of poisoned persons by years of research

The number of patients, when it comes to gender structure in three-year research, is such that there is far larger number of men than women, i.e. larger number of male alcohol addicts -338 (75%) in relation to women - 112 (25%), in ratio 3:1. There is no statistical difference by years of research χ2=2,019, p=0,364>0,05.
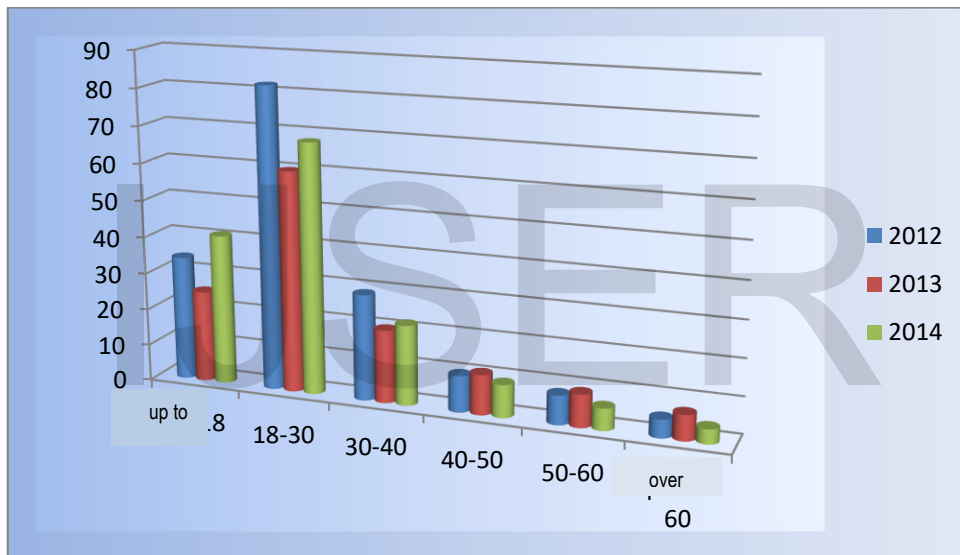

Graph no. 3 Overview of registered patients poisoned with alcohol, by age

When it comes to the issue of age structure in our research in Bugojno, lasting three years, the largest number of persons who came were 18 to 30 years of age and they were 210 (47%), while a smaller number of persons is in the age over 60 years and they were 16 (3%). The difference shown is statistically important $\chi^2=3,378$ p=0,765>0,05.
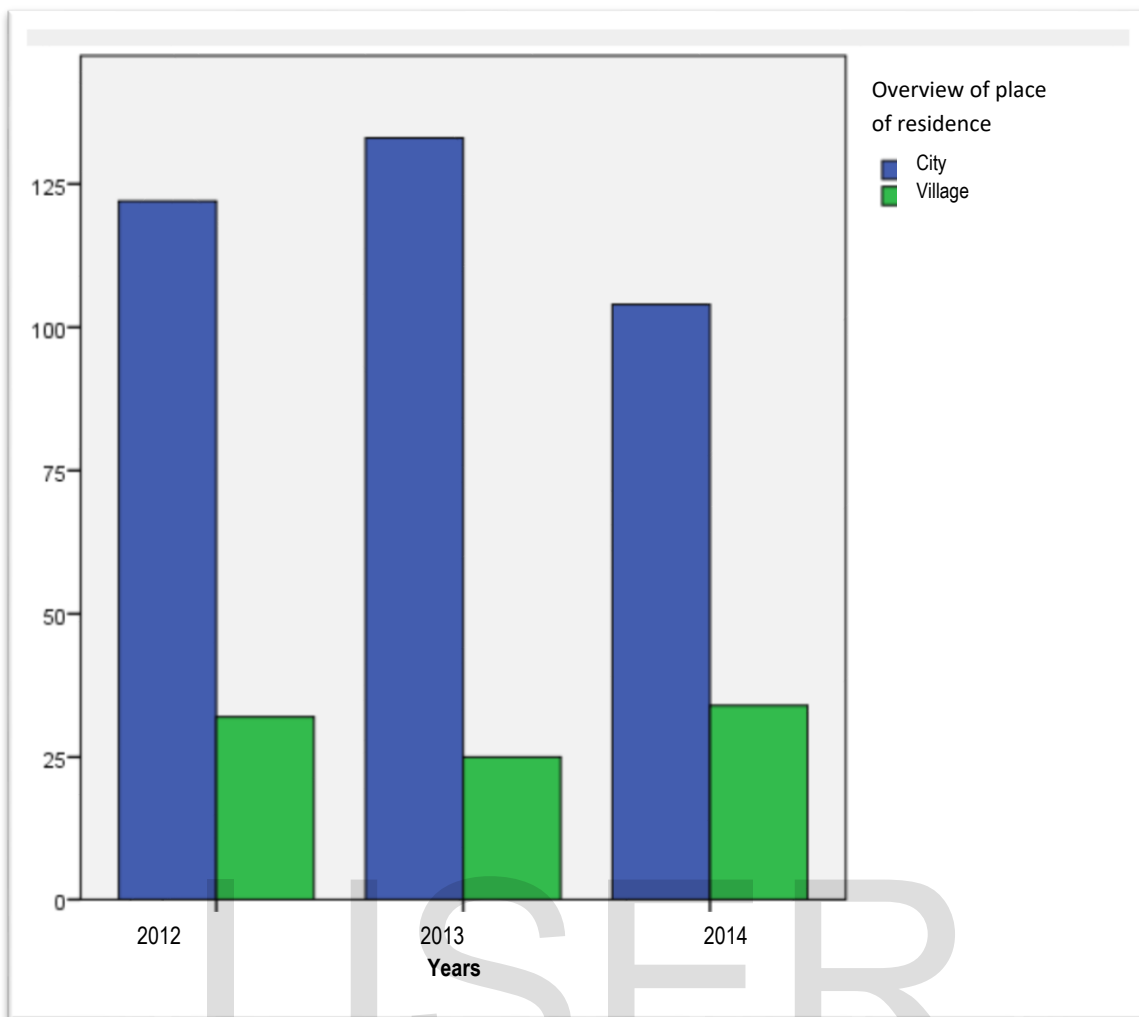
Graph no. 4 Overview of place of residence of persons under influence of alcohol

There is no statistical difference between the place of residence of addicts and different years in which the patients were treated χ^2=3,593, p=0,166>0,05. Regardless of years (2012, 2013, 2014) the city dominates as place of addict's residence. In three-year research, 359 (80%) of patients are from the city, while 91 (20%) are from the village.
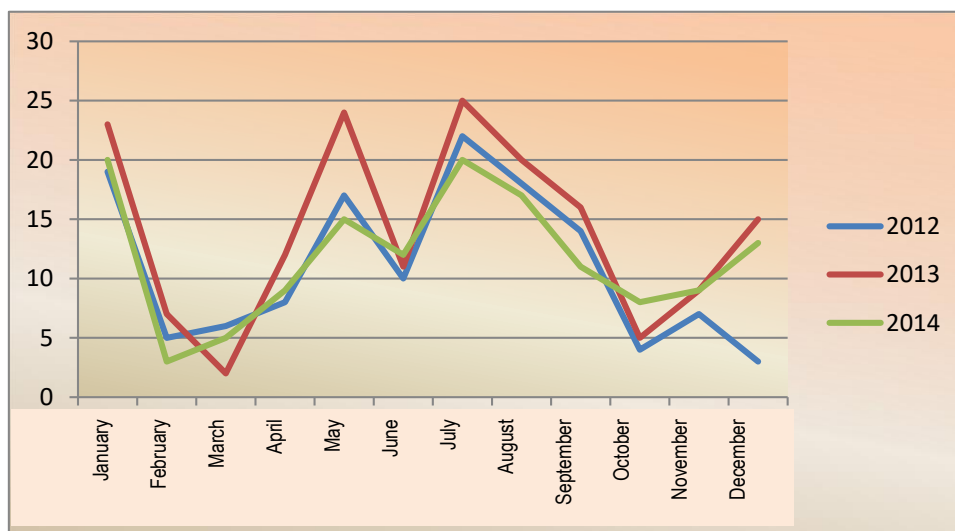
Graph no. 5 Overview of alcohol poisoning cases by months

Based on three-year research by months, we may see that the largest number of poisoned persons was during the holidays (New Year, First of May) and in summer period. The most frequent intoxications in all three years were in July, and they were 67 (15%), then in January

62 (14%).
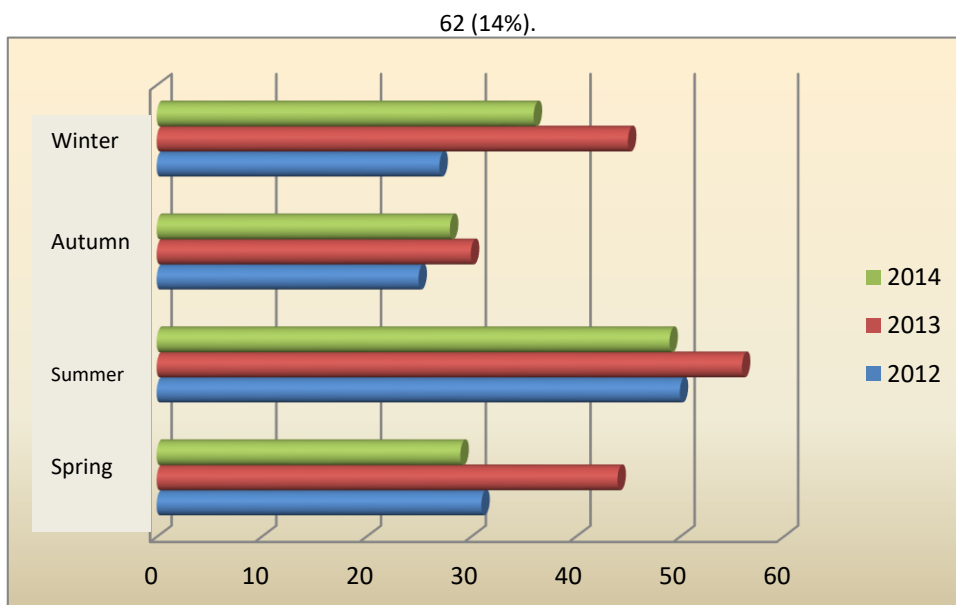
Graph no. 6 Number of patients poisoned with alcohol by seasons in three years

According to research, we may see that the largest number of poisoned persons is in summer period. In 2012, there were 50 (38%), in 2013 – 56 (32%), in 2014 – 155 (35%) poisoned persons.

The survey was conducted on the problem of alcohol in Secondary Technical School in Bugojno. The survey contains 20 questions and it is of anonymous character. The survey included 64 students of male gender and 34 students of female gender. The students were in 3rd and 4th grade. Here are some questions and answers.
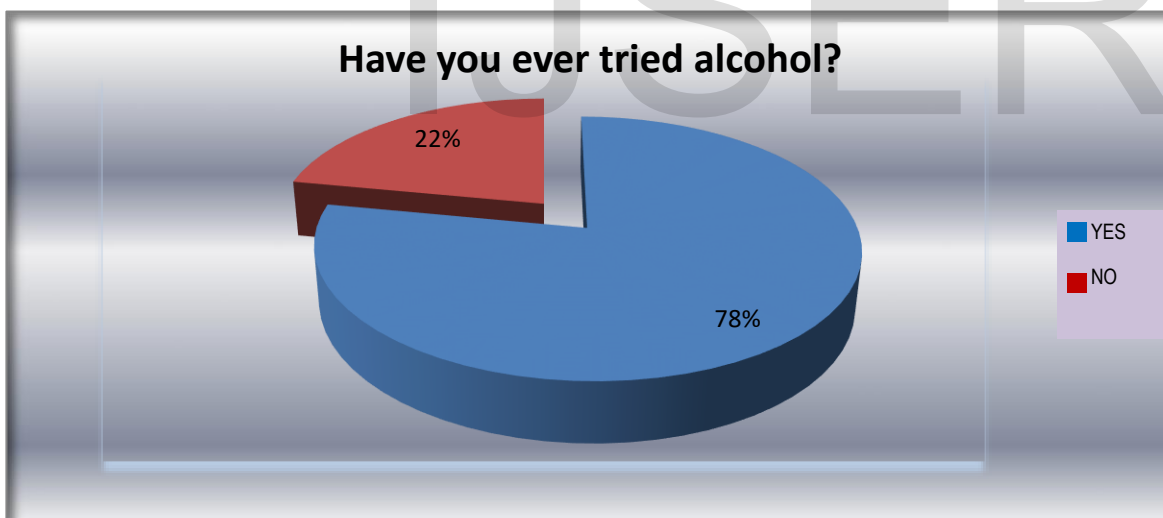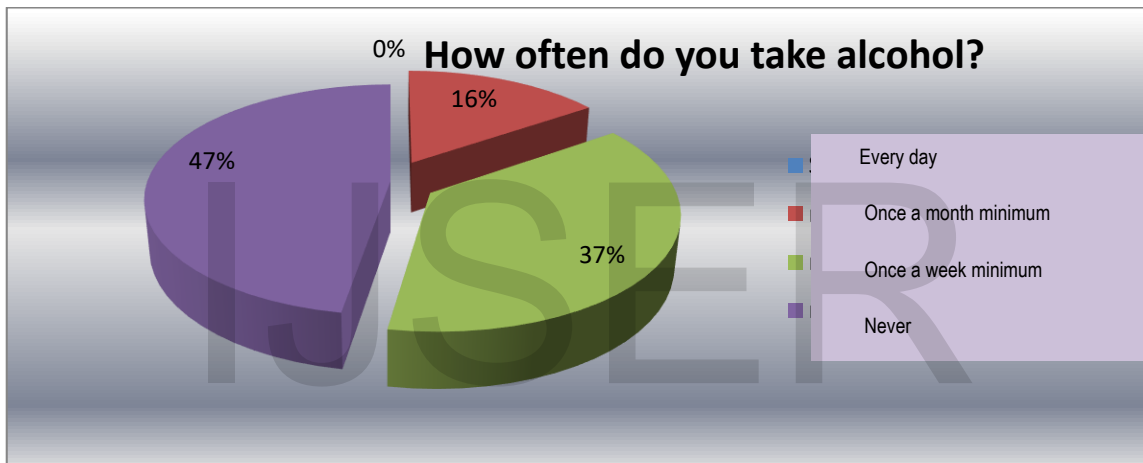

Graph no. 8 Overview of first survey question

When asked "Have you ever tried alcohol?", of the total of 100 students, 78 (78%) stated that they have tried alcohol, while 22 (22%) students stated they have not tried alcohol. The difference shown is statistically significant $\chi2=31,360$, $p=0,000<0,05$.
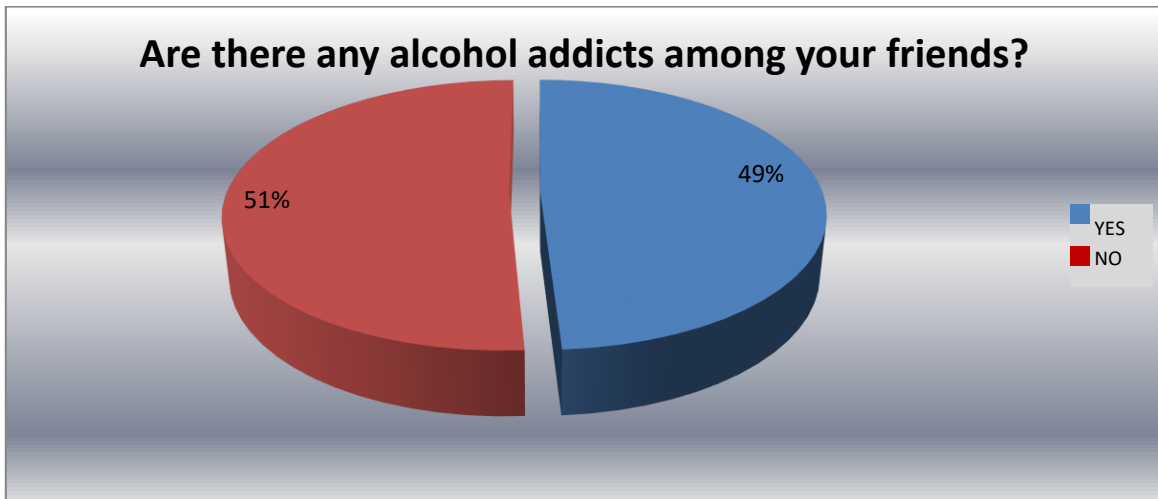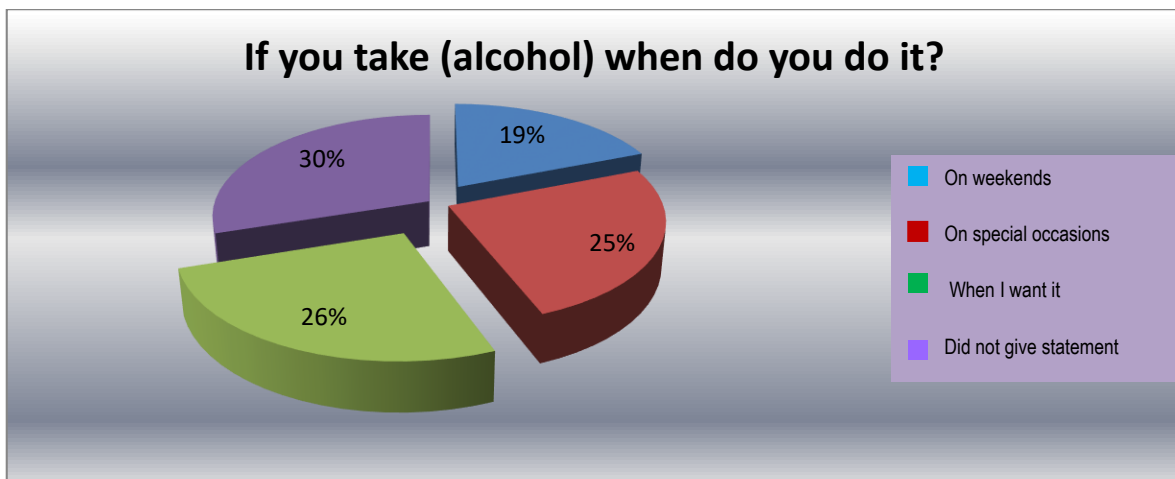
Graph no. 9 Overview of third survey question

When asked "Are there any alcohol addicts among your friends?", of the total of 100 students, 49 (49%) students answered that there are alcohol addicts among their friends, while 51 (51%) students answered that there are no alcohol addicts among their friends. The difference shown is not statistically significant $\chi^2=0,160$, p=0,689>0,05.

Graph no. 10 Overview of fourth survey question

When asked "How often do you take alcohol?", a total of 100 students gave statements. Of the total number of students, none of them takes alcohol every day, 16 (16%) students take alcohol once a month minimum, 37 (37%) students take alcohol once a week minimum, while 47 (47%) students never take alcohol. The difference shown is statistically significant $\chi^2=14,480$, p=0,001<0,05.

Graph no. 11 Overview of fifth survey question

When asked "If you take (alcohol) when do you do it?", of the total of 100 students, 19 (19%) students answered they do it on weekends, 25 (25%) students answered they do it on special occasions, 26 (26%) students answered they take alcohol "when I want it", while 30 (30%) students never take alcohol. The difference shown is not statistically significant χ^2=2,480, p=0,479<0,05.

Graph no. 12 Overview of sixth survey question

When asked "What alcoholic drinks do you take the most often?", of the total of 100 students, 23 (23%) students stated they take beer, 18 (18%) students stated they take wine, 21 (21%) students stated they take hard drinks, while 38 (38%) students did not give statement. The difference shown is statistically significant χ^2=9,840, p=0,02<0,05. Most students drink alcohol (62%) and the most they take beer (23%).
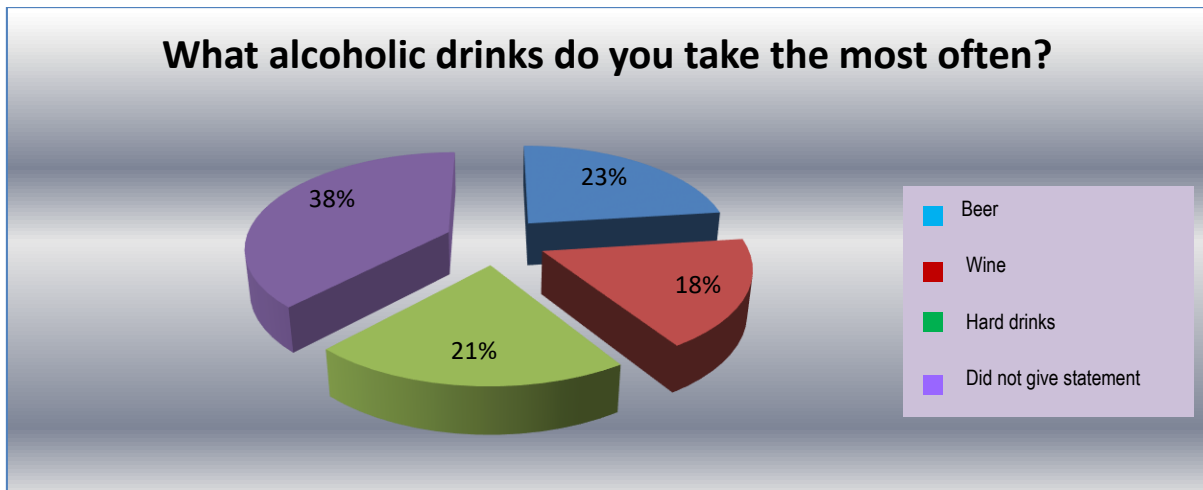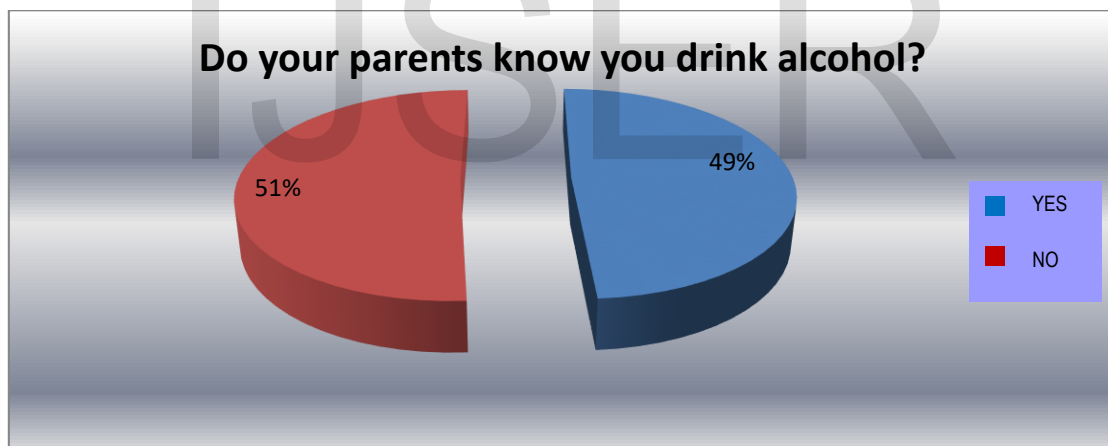

Graph no. 13 Overview of eighth survey question

When asked "Do your parents know you drink alcohol?", a total of 100 students gave statements. Of the total number of students, 49 (49%) students answered that their parents know they drink alcohol, while 51 (51%) students answered their parents do not know they drink alcohol. The difference shown is not statistically significant χ^2=0,040, p=0,841>0,05.

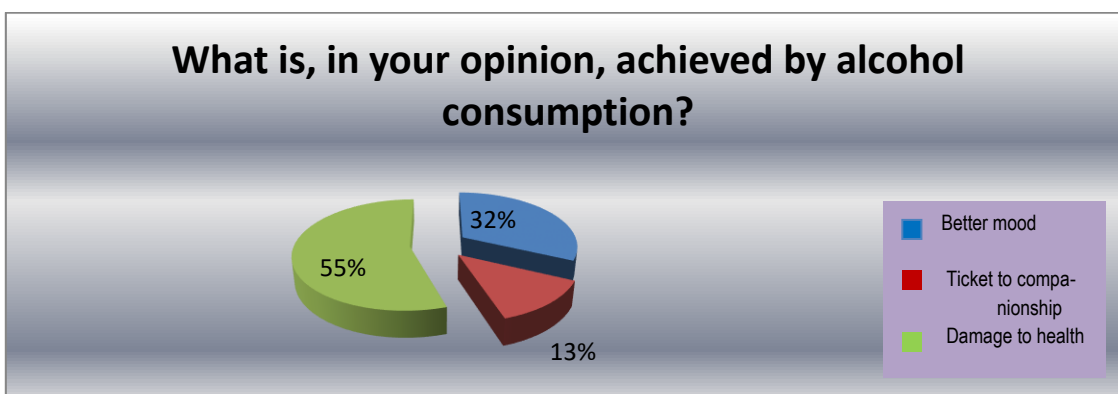**Do you think alcohol is a ticket to companionship?**

20%

80%

YES
NO
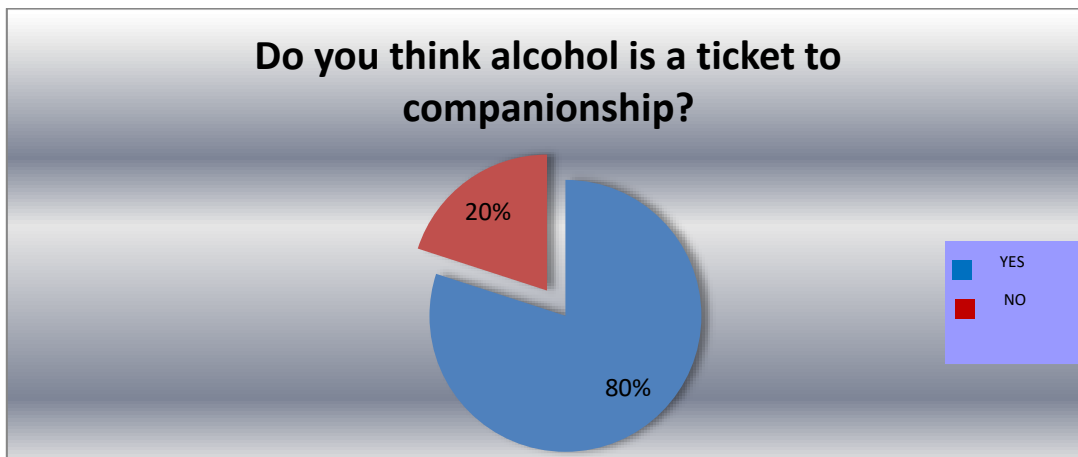
Graph no. 15 Overview of ninth survey question

When asked "Do you think alcohol is a ticket to companionship?", of the total of 100 students, 80 (80%) students answered that alcohol is a ticket to companionship, while 20 (20%) students answered that alcohol is not ticket to companionship. The difference shown is statistically significant $\chi^2=36,000$, p=0,00<0,05.

Can you freely buy alcohol at newsstands, in supermarkets, stores,...?

22%

78%

YES
NO

Graph no. 16 Overview of twelfth survey question

When asked "Can you freely buy alcohol at newsstands, in supermarkets, stores, …?", of the total of 100 students, 78 (78%) students answered they can freely buy alcohol at newsstands, in supermarkets and stores, while 22 (22%) students answered they cannot buy alcohol freely at newsstands, in supermarkets and stores. The difference shown is statistically significant $\chi^2=31,360$, p=0,00<0,05.

What is, in your opinion, achieved by alcohol consumption?

32%

55%

13%

Better mood
Ticket to compa-
nionship
Damage to health

Graph no. 17 Overview of thirteenth survey question

When asked "What is, in your opinion, achieved by alcohol consumption?", of the total of 100 students, 32 (32%) students answered that by alcohol consumption better mood is achieved, 13 (13%) students answered that it is a ticket to companionship, and 55 (55%) students answered that alcohol damages health. The difference shown is statistically significant $\chi^2=25,220$, p=0,00<0,05.
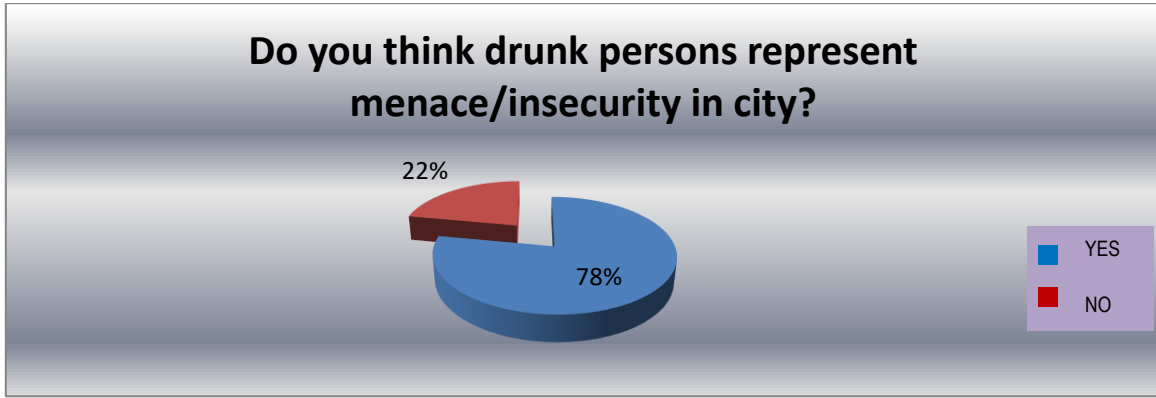
Graph no. 18 Overview of fourteenth survey question

When asked "Do you think drunk persons represent menace/insecurity in city?, of the total of 100 students, 78 (78%) students answered that drunk persons represent menace/insecurity in city, while 22 (22%) students answered that drunk persons do not represent menace/insecurity in city. The difference shown is statistically significant χ^2=31,360, p=0,00<0,05. We see that a large number of surveyed students believe that alcohol consuming persons represent a safety hazard in the city.
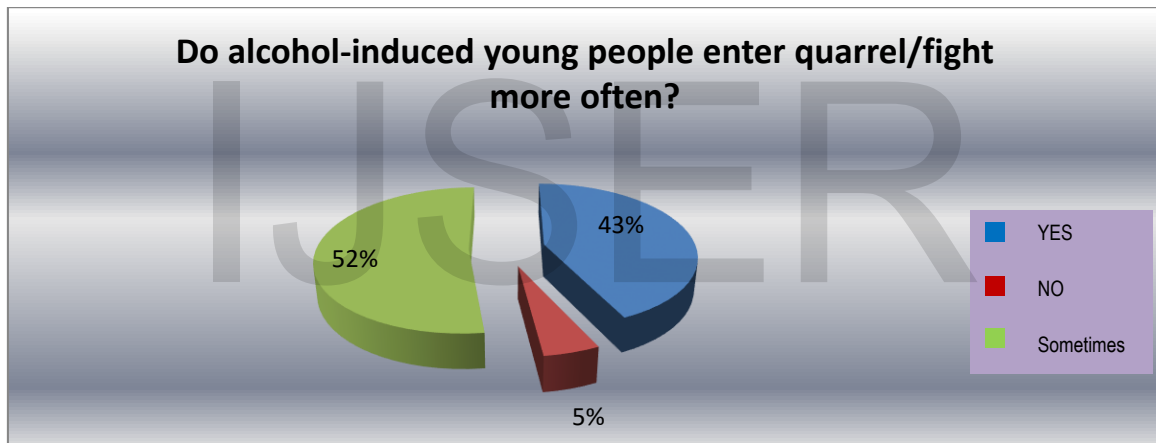
Graph no. 19 Overview of sixteenth survey question

When asked "Do alcohol-induced young people enter quarrel/fight more often?", of the total of 100 students, 43 (43%) students gave positive answer, 5 (5%) students gave negative answer, 52 (52%) students answered that young people sometimes enter quarrels/fights more often due to alcohol. The difference shown is statistically significant χ^2=37,340, p=0,00<0,05.
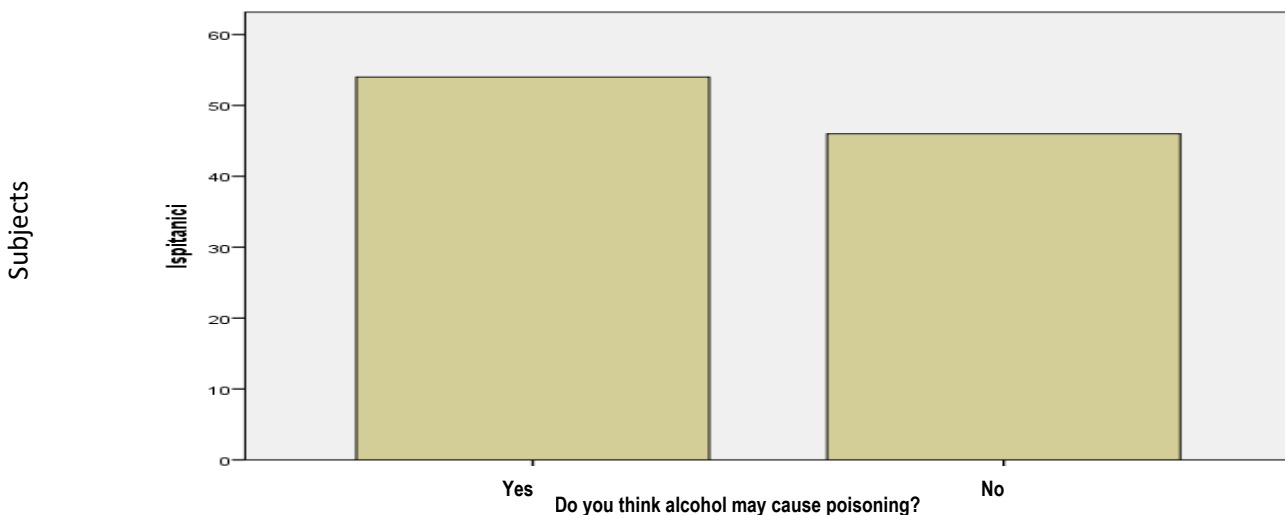
Graph no. 20 Overview of seventeenth question

When asked "Do you think alcohol may cause poisoning?", of the total of 100 students, 54 (54%) students gave positive answer, while 46 (46%) students gave negative answer. The difference shown is not statistically significant $\chi^2=0,640$, p=0,424>0,05.

Graph no. 21 Overview of nineteenth survey question

When asked "Have you ever listened to a lecture about alcohol?", of the total of 100 students, 38 (38%) students gave positive answer, while 62 (62%) students gave negative answer. The difference shown is statistically significant $\chi^2=49,000$, p=0,000<0,05.
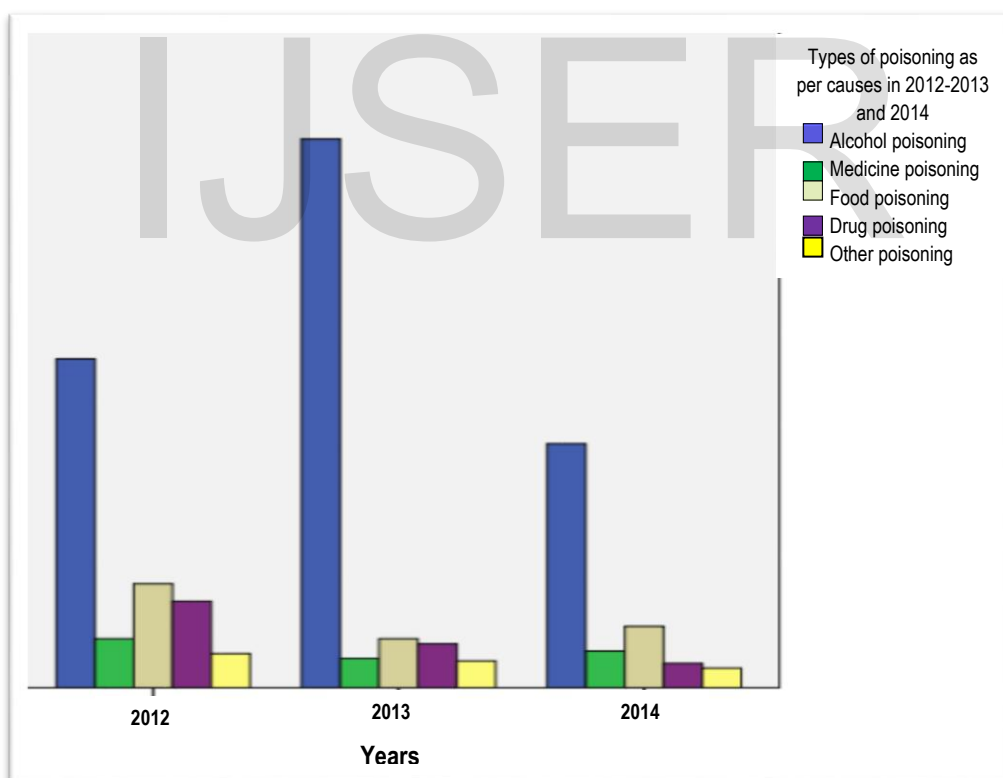
Graph no.22 Types of poisoning as per causes in 2012, 2013 and 2014

From the graph, in all three years, we may see that alcohol poisoning is the most common and it makes more than half of all registered poisonings.

• **DISCUSSION**

Alcoholism is a disease that occurs in all regions, is spread all over the world, and is considered a number three disease of modern society (after cardiovascular diseases and Ca). According to estimates of World Health Organization, 3% of population suffer from this disease. This number, however, should be multiplied by three, since the alcoholic jeopardizes the health of at least three persons around him/her. It should be specially noted that alcoholism in women is on increase and that ratio in last several years is 1:3, i.e. one woman alcoholic in comparison to three men alcoholic [9].

From the aforementioned, it is obvious that alcoholism is a very complex disease, and that complexity manifests in its etiology, serious psychological problems, life-threatening bodily conditions, disruption of family and general social relations, work inability, moral degradation, impoverishment, alienation, shortened life expectancy, and often the most drastic consequence: suicide. Because of all the above-mentioned, treatment of persons suffering from alcoholism is multiple and complementing, where numerous methods of treatment are combined. Drinking alcohol, especially in young people, is more and more common, so that Croatia, 12 years ago, by ratio of the children who consumed alcohol during last year was below average, while in 2007, by the same parameter, it was above the European average (average 82%, Croatia 84%) [10].

According to the alcohol consumption indicator per capita, it is registered that adult citizens of European Union drink 12,5 liters of pure alcohol per year, or 26,9 grams of pure alcohol per day (which corresponds to the quantity of more than two standard drinks or 12 g of pure alcohol per day). More than twice the amount of alcohol per capita is consumed in European Union countries than in the world; global average in 2004 was 6,1 liters per capita [11].

When it comes to the issue of age structure in our research in the Emergency Medical Care Department in Bugojno, during three years of research, the largest number of persons who came in and where Emergency Medical Care Department intervened were in the age from 18 to 30 years and they were 210 (47%), while there is a smaller number of persons in the age over 60 years and they were 16 (3%). This means that regardless of years (2012, 2013, 2014), the age from 18 to 30 years is dominant. In the research of alcohol poisoning in ZHMP Sarajevo, in 2012, the most common age was 20-40, then 50-60 years. In comparison, the presented results of the research conducted in Istočno Sarajevo in 2013 show that of the total of 118 alcoholic patients, who received help from Emergency Medical Care Department Istočno Sarajevo, there was also a larger number of men 72 (61%) in comparison to women 46 (39%), which is the ratio 2:1. The results of that research showed that the most represented percentage of patients who consumed alcohol is in the age group over 50 years (27,96%), and then age group from 21 to 29 years (24,57%). It is followed by age group from 30 to 39 years (16,94%), then from 11 to 20 years (13,55%), while the age group from 40 to 49 years (12,71%) is at the last place. The patients whose year of birth is not registered were 4,23 % [12]. In our research, the ratio of alcoholics, men: women, is 3:1, while in the research in ZHMP Sarajevo in 2011 the ratio was 9:1.

For a large number of deaths of young persons, alcohol is a cause, and it has psychoactive, cytotoxic and addictive effect. In the United States of America, in 1988, more than seven thousand teenagers were killed in car accidents caused by driver under the influence of alcohol [13]. The research published in 2009 in Canton of Sarajevo showed that driver alcoholism is one of important causes of traffic accidents and traffic unsafety [14].

From the results of our research we have established that, as in other researches available to us, the men are the ones who drink alcohol more and get drunk. The number of women who get drunk is not negligible either. When it comes to the issue of age structure in a three year research, the number of patients is such that there is far larger number of men than women. There were 338 (75%) men with alcohol intoxication in relation to women – 112 (25%). Regardless of different years of treatment, male gender dominates as alcohol addict. According to two-year research in Institute of Emergency Medical Care Sarajevo, 1.147 medical interventions were performed in cases of patients with acute poisoning by ethyl alcohol, of which in 2012 there were 749 patients (88% men and 12% women), and in 2013 the number decreased nearly twice, i.e. 408 patients (86% men and 14% women) [15]. Far larger number of patients living in cities is expected, since the availability of procurement is more accessible in urban places (cities) than in rural ones (villages). In three-year research, 80% of patients are from the city, while 20% are from the village. Based on three-year research by months, the largest number of poisoned persons was during the holidays (New Year, the First of May) and in summer period. The most common poisonings were in the month of July and they were 67 (15%) (Graph no. 5). According to our research, we may see that the largest number of poisoned persons is in the summer period due to holidays, vacation, greater social activity, people go out more in cafes, parks and night clubs. In 2012, there were 50 (38%), in 2013 56 (32%), in 2014 155 (35%) of poisoned persons (Graph no. 6). Also in the research in ZHMP Sarajevo in 2011, the most of alcohol poisonings occurred in summer and then in winter.

A total of 100 students participated in the alcohol-related problem research of survey questionnaires, which was conducted in the Secondary Technical School in Bugojno. The students were in third or fourth grade of secondary school. Of that number, 64 (64%) students were male gender and 36 (36%) students of female gender. The survey contained 20 questions and it had anonymous character. In our research, when asked "Have

you ever tried alcohol?", majority 78/100 (78%) students stated they have tried alcohol, while only 22/100 (22%) students stated they have not tried alcohol.

In anonymous survey on alcohol abuse conducted in Secondary Electrotechnical School for Electrical Energy in Sarajevo in 2014, the research shows that also most of surveyed students of the total of 91, 77/91 (85%) have consumed so far some alcoholic drink, while 14/91 (15%) have never consumed it [15].

A total of 100 students gave statement about the question"How often do you drink alcohol?" Of the total number of students, no student drinks alcohol every day, 16 (16%) students drink alcohol once a month minimum, 37 (37%) students drink alcohol once a week, while 47 (47%) students never drink alcohol. According to the research conducted on a random sample of 1004 students from the area of entire Bosnia and Herzegovina, entitled "Study on Youth in Bosnia and Herzegovina", 3,1% of youth consume alcoholic drinks every day, 5,7% consumes several times a week, and 15,5% consumes during weekend [16].

When asked "Do you think alcohol is a ticket to companionship?", 80/100 (80%) students answered that alcohol is a ticket to companionship, while 20/100 (20%) students answered that alcohol is not a ticket to companionship. It happens often that, due to general acceptance of alcohol in the society, young people experience alcohol as desired form of behavior. When asked what is achieved by consuming alcohol, we see that most of surveyed students are aware that alcohol damages their health, while for a small number of surveyed students it is the means for better mood or ticket to companionship. Regardless of that, however they consume alcohol. Also most of surveyed students know that alcohol may lead to poisoning. The most common alcoholic drink is a beer and they know that for creation of addiction it takes several years of regular drinking. It is also visible from the survey that they would not recommend drinking alcohol to another person, which is positive. The parents of 49% of students know that they drink alcohol from time to time, but they do not undertake anything. Much larger number of students answered they may freely, as minors, buy the alcohol thereby violating the law on prohibition to purchase alcohol for minor persons. In the survey research conducted in Sarajevo in 2014, by random selection in Electrotechnical School for Electrical Energy, a survey is conducted of 91 students, where every second student (or 52%) drinks alcohol for good entertainment, every fourth student (or 24%) because of curiosity, every eighth student (or 13%) drinks alcohol to prove in society, 8% of students take alcohol due to family problems, and 3% due to problems in school [15]. This shows that, although they are aware of harmfulness of drinking alcohol, most of them still take alcohol. Alcohol abuse is a huge problem in 10-20% of adolescents aged from 13 to 17 years. In USA, three millions of young people have drinking problem, while 300 thousand adolescents are dependent on alcohol. One third of adolescents are treated in trauma-centers due to consequences of alcohol consumption [17]. It is visible from our survey that the use of alcohol more often leads to quarrels and fights (Graph 19). Based on survey question posed if they have listened to some lecture about alcohol, we may see that a large number of students (62%) have not listened to lecture, while a small number of students have listened to lecture on alcohol. This shows that considering that majority drink, lectures on problem of alcohol should be additionally intensified.

According to overview of poisoning in Bugojno by various causes in 2012, alcohol poisoning was the most common – 132 (54%), medicine poisoning – 20 (8%), food poisoning – 42 (17%), drug poisoning – 35 (15%), and other poisonings – 14 (6%).

In 2013, there were 220 (78%) alcohol poisonings, medicine poisonings – 11 (4%), food poisonings - 19 (7%), drug poisonings – 20 (7%), other poisonings - 11 (4%).

In 2014, there were 98 (63%) alcohol poisonings, medicine poisonings – 15 (10%), food poisonings 25 (16%), drug poisoning – 10 (6%) and other poisonings 8 (5%), (Graph no. 22).

According to the data of Yearbook of Poisoning Control Center "VMA", which was issued in 2010, the Department of Admission and Resuscitation of Patients, 3996 patients are registered. Of that, 47% consumed alcohol, 35% excessively used medicines, while at the third place, and 8% were users of psychoactive substances [18]. According to the research published in Emergency Medical Care Department in Bečej, in the period from 01.01.2010 to 31.12.2012, there were 29670 patients of whom accidental and intentional poisonings include 195 patients or 0.66%. Most of them were men – 126 (64,62%) and 69 (35,38%) were women. The average age in 36,79 years. The most of poisonings were caused by alcohol – 100 (51,28%), then by medicines – 62 (31,79%) or combination of alcohol and medicines – 8 (4,10%). In other cases, there was identified poisoning caused by opiates, cleaning agents in household, oil based agents, pesticides, carbon monoxide and insulin [19].

In the research of ZHMP Sarajevo, in 2012 and 2013, the most of poisonings were caused by alcohol in more than 50% [22]. It is visible from the results that preventive measures are necessary, considering that a large number of young people drink alcohol, because of physical accessibility of alcohol, since it is visible from graph no. 16 that alcohol is accessible to all. These measures may influence significantly certain age limit for taking alcohol, as well as policy for determination of number, type and location of selling spots of alcohol. It is very important to implement these measures in the practice. It is also important to carry out education, also among older population, in relation to alcohol abuse. Alcoholism is a disease as all other diseases that should be treated.

- **CONCLUSIONS**

  - According to the data obtained from the Emergency Medical Care Department Bugojno, in three-year research, a total of 450 patients with acute alcohol poisoning were admitted. Of that number, 338 (75%) were men and 112 (25%) were women. Most patients with alcohol poisoning are men in ratio 3:1 in relation to women. When it comes to the issue of age structure in three-year research, the largest number of persons who came were the persons from 18 to 30 years of age, and they were 210 (47%), while a small number of persons were from 40 to 65 years of age and they were 172 (38%). This means that regardless of years (2012, 2013, 2014) the age from 18 to 30 is predominant. They get drunk more in the city than in the village.

  - According to the data obtained from the survey, we may conclude that many young persons deliberately drink and admit they cannot imagine going out without alcohol, although they claim they are aware of possible consequences of such risky behavior. This problem affects young people who start to consume alcohol earlier and earlier, thereby alcohol becomes a part of their everyday life. Public health problems and their consequences are solved in different ways, but the best solution is to prevent their occurrence. Preventive activities should be directed to overall population of young people, and especially to groups of young people with risky behaviors. It is necessary to reduce alcohol consumption, educate young people about alcohol-induced harm, aiming at raising awareness. Animate young people to engage in sports.

  - According to three-year research conducted in Emergency Medical Care Department in Bugojno, we may conclude that alcohol poisoning, same as in other researches accessible for us, was the most common in relation to other poisonings.

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