

Impact of Hereditary Factors on Adolescents' Behavior Related to Tobacco, Alcohol and Drugs Use in Bosnia and Herzegovina

Ifeta Licanin¹, Amira Redzic², Amira Dedic³

Psychiatric Clinic of University of Sarajevo, Bosnia and Herzegovina¹

Department of Biology and Human Genetics, Faculty of Medicine, University of Sarajevo, Bosnia and Herzegovina²

Department of Oral Medicine and Periodontal Diseases, Faculty of Dental Medicine, University of Sarajevo, Bosnia and Herzegovina³

SUMMARY

Objective: Youngsters like to experiment with risky life styles, without adequate knowledge about long-term health effects. Bosnia and Herzegovina is currently going through transition period and is a postwar society with various risk factors for drugs abuse (economic, social and health). The main objective of the research was to describe adolescents behavior in consumption of alcohol and in relation to area type, gender, religion, age, parental attitude, friends and to investigate effect of biological hereditary factors related to certain behavior. **Methods:** This epidemiological research was done in urban and rural areas of Sarajevo Canton, involving 368 adolescents: 170 males, 198 females; aged 12-17, with equal urban and rural distribution. The research tool used was Q 2004 (K.B. Kelly, 2000). Using this tool, impact of hereditary factors related to tobacco, alcohol and drugs was explored and EPI info was used for statistical analysis. **Results:** Out of total number of individuals involved in the study 25.8% were found to be cigarette smokers, 39.4% consumed alcohol, and 2.2% consumed marijuana. Out of total number of adolescents who use alcohol, 43.4% are from rural and 56.6% urban area; 69.0% come from high school and 31% from primary; 53.1% are male; 46.9% female; 44.8% alcohol consumers smoke tobacco vs. 13.5%; 4.8% use drugs and alcohol vs. 0.4%. Mean age of alcohol consumption beginning was 14. Results determine genealogical analysis of frequency of consuming alcohol and tobacco related paternal side (maternal side rarely) and adolescent. It is not proved that hereditary factors play important role in use of these substances. Impact of hereditary factors among drug users is negative. **Conclusion:** Adolescents in developing countries tend to abuse psychoactive substances. It is determined that parents (particularly father) use tobacco and alcohol, but rarely. None of above mentioned family members abuse drugs. Therefore, impact of hereditary factors related to abuse drugs is not proved. These results could be used to develop an appropriate prevention strategy. It is necessary to be aware of all relevant risk factors. Quality of life depends of these factors, and treatment should be multidisciplinary for these cases, including medical, genetic and dental experts in the field.

Keywords: biological inheritance, adolescents, alcohol, risk behavior, drug abuse

1. INTRODUCTION

Although drug abuse exists in every life stage, its appearance in adolescence seems the most concerning due to consequences that are harmful for the further development of character and quality of life. Youngsters like to experiment with risky life styles, without adequate knowledge about their long-term health effects.

Bosnia and Herzegovina has all characteristics of the post-war community and post-traumatic society with huge numbers of unemployed, people with bodily injuries, as well as people with mental disorders caused by the war related stress. A large number of suicides and homicides, increase in criminal activity and violence as well as increased use of alcohol and other psychoactive substances are present.

Bosnia and Herzegovina is a postwar society, currently going through transition period. Therefore, various risk factors for drug abuse can be identified, such as economic, social and health (1).

We are facing a massive Posttraumatic Stress Disorder and some individuals are trying to fight its symptoms through self-help using alcohol, tobacco and other substances. At the same time, this syndrome occurs more frequent in co morbidity with other psychiatric disorders, mainly with the psychoactive substances abuse (2).

The current data on the level of abuse of alcohol and other substances in Bosnia and Herzegovina are not available, but it is believed that the number of such cases is higher than before the war. Among the most commonly abused substances is cannabis, medicines for Parkinson's disease, glues, solvents, heroin, ecstasy, sedatives and hypnotics, alcohol, tobacco, rare hallucinogens, cocaine, etc.

Goal was to analyze how the circumstances mentioned earlier influence the frequency of use (abuse) of psychoactive substances (tobacco, alcohol, cannabis) by adolescents and to focus to define how many adolescents

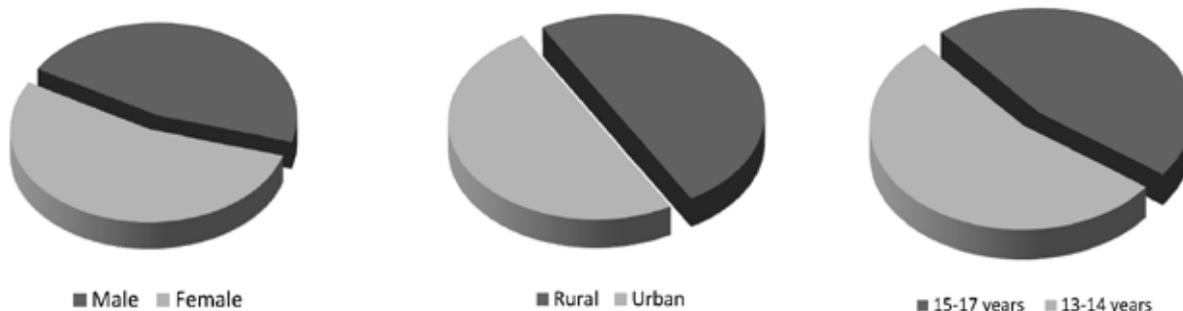


Chart 1a, 1b and 1c. Sample distribution in our research by sex, research areas and age.

who abuse drugs have been engaged in risk behavior and, subsequently, exercised more frequent sexual intercourse and aggressive behavior. By identifying the risk factors, involved appropriate preventive measures could be selected.

2. SAMPLE AND METHOD OF RESEARCH

KIND OF RESEARCH

The conducted study was of prospective, epidemiological-analytical character. Finding hereditary factors related to tobacco, alcohol and drug abuse was explored using tool Q 2000.

THE SAMPLE

Our research involved 368 adolescents in Sarajevo canton, attending elementary and high schools, of equal gender and age distribution and urban-rural distribution as well. The Ethical Standards Committee of Sarajevo University approved the survey, as did the school boards. Parents' organizations and teachers were informed. Students themselves were informed verbally and in writing, and they consented.

THE INSTRUMENTS OF RESEARCH

The needed information we got by filling in the Q 2000, a Bosnian version of original questionnaire made by Dr. Christina Berg Kelly from Sweden (3). The test was made in years 1990 and 1991 it was scientifically valuable and widely accepted throughout the world. It contains a wide range of questions about all relevant events, which could affect the use, and abuse of drugs. The questions contain every aspect of adolescents' life: health culture, life style and conduct in school community. Bosnian version was made together with Swedish and Bosnian expert, tested through pilot projects in schools. After that, some correction was made and final Bosnian version was finished.

The anonymous polling was performed in schools on volunteer basis. The preparations for the research and research itself were realized in 2008.

3. RESULTS

The results of the research were achieved by the analysis of data using standard statistical methods, software program EPI-INFO, and they were mainly shown by tables and graphs (4).

Charts 1a, 1b and 1c present the basic demographic characteristics of our sample. The sample can be considered as coherent regarding the gender, type of settlement and age.

Significantly more adolescents who lives in an urban

area (56.6%) drinks alcohol compared to the ones living in the rural part (43.4%)

As expected older adolescents use alcohol more often than younger ones. In 9th grade 69% of pupils drink, while only 31% of pupils in the 7th grade.

		Do you drink alcohol?		Total	
		Yes	No		
Settlement	Vogošća (rural)	N	63.0	121.0	184.0
		%	43.4	54.3	50.0
	Sarajevo (urban)	N	82.0	102.0	184.0
		%	56.6	45.7	50.0
Total		N	145.0	223.0	368.0
		%	39.4	60.6	100.0

$\chi^2 = 4.108$ $p = 0.043$

Table 1. Alcohol consumption according to type of settlement

		Do you drink alcohol?		Total	
		Yes	No		
Grade	9th grade	N	100.0	100.0	200.0
		%	69.0	44.8	54.3
	7th grade	N	45.0	123.0	168.0
		%	31.0	55.2	45.7
Total		N	145.0	223.0	368.0
		%	39.4	60.6	100.0

$\chi^2 = 20.607$ $p = 0.0001$

Table 2. Alcohol consumption according to school grade

		Do you drink alcohol?		Total	
		Yes	No		
Gender	Boy	N	77.0	93.0	170.0
		%	53.1	41.7	46.2
	Girl	N	68.0	130.0	198.0
		%	46.9	58.3	53.8
Total		N	145.0	223.0	368.0
		%	39.4	60.6	100.0

$\chi^2 = 4.594$ $p = 0.032$

Table 3. Alcohol consumption according to gender

Boys significantly, more use alcohol than girls in 53.1% compared to 46.9%.

The area of research determined that the majority of youth in the sample are Muslims, and because of the small number of respondents from other religious groups, it was not possible to compute the statistical differences.

However, we can notice that although Islam forbids drinking of alcohol almost 40% of respondents drink alcohol at least occasionally.

		Do you drink alcohol?		Total
		Yes	No	
Muslim	N	140.0	220.0	360.0
	%	38.8	61.2	97.8
Orthodox	N		2.0	2.0
	%		100.0	0.5
Catholic	N	2.0		2.0
	%	100.0		0.5
Other	N	1.0		1.0
	%	100.0		0.3
I'm not religious	N	2.0	1.0	3.0
	%	66.6	33.3	0.8
Total	N	145.0	223.0	368.0
	%	39.4	60.6	100.0

X2= not computed

Table 4. Alcohol consumption according to religion

In the baseline sample there is a significant number of children and adolescents who drink alcohol (39.4%), smoke (25.8%) and even consume illicit drugs, but to much smaller extent (2.2%).

When we tested the habits of alcohol use, the result was that the majority of respondents used alcohol only couple of times (25%) and still have not develop the habit of drinking. However, there is significant number of those

	N	%
Yes, every day or almost every day	1	0.3
Yes, couple of times per week	6	1.6
Yes, once a week	7	1.9
Yes, couple of times per month	7	1.9
Yes, once a month	2	0.5
Yes, couple of times per year	25	6.8
No, but I have tried couple of times	92	25.0
No, I quit drinking	5	1.4
I never try alcohol	223	60.6
Total	368	100.0

Table 5. Frequency of alcohol use

(12.7%) who drink on an annual, monthly or weekly basis. Only 0.3% respondents drink on every day basis.

The attendance of religious services is quite lower in the group of alcohol users, so 62.1% of them do not go to the church/mosque on a regular basis, compared to the group of non-drinkers where 44.3% do not attend services regularly. This is also proven by the results of chi-square test (p<0.05).

Adolescents who use alcohol have higher average body

		Do you drink alcohol?		Total
		Yes	No	
If you are religious, please tell us do you ...	Go to Church/ Mosque regularly	N 55.0	124.0	179.0
		% 37.9	55.6	48.6
	Don't go to Church/ Mosque every time	N 90.0	99.0	189.0
		% 62.1	44.3	51.3
Total		N 145.0	223.0	368.0
		% 39.4	60.6	100.0

X2= 10.992; p=0.004

Table 6. Attendance of religious services?

weight, height and BMI score compared to non-drinkers, however these differences cannot be considered as statistically significant.

	Do you drink alcohol?	N	Mean	Std. Deviation	Std. Error Mean
	No	223	53.98	9.545	.639
Height	Yes	145	168.24	9.551	.793
	No	223	165.12	8.100	.542
BMI	Yes	145	20.80	2.818	.234
	No	223	19.75	2.847	.191

Table 7. Physical characteristics according to alcohol consumption

		Do you drink alcohol?		Total
		Yes	No	
Do you smoke?	Yes	N 65.0	30.0	95.0
		% 44.8	13.5	25.8
	No	N 80.0	193.0	273.0
		% 55.2	86.5	74.2
Total		N 145.0	223.0	368.0
		% 39.4	60.6	100.0

X2= 45.164 p=0.0001

Table 8- Tobacco use according to alcohol consumption

	Drink alcohol	Total	X ²	P
If you smoke does your parents allows it	N 8	8	46.022	0.0001
	% 5.5	2.2%		
Does your parents allow you to drink alcohol	N 9	9	368.0	0.0001
	% 6.2%	2.4%		
If you drink alcohol, does your parents knows about it	N 38	38	368.000	0.0001
	% 26.2%	10.3%		

Table 9. Parents awareness about tobacco and alcohol use (only users)

Alcohol consumers also use more often tobacco. Almost one half (44.8%) of those who use alcohol also smoke tobacco compared to only 13.5% of those who does not drink.

Only a small percentage of parents (5.5%) allow their children to smoke tobacco, as well as to drink alcohol (6.2%). What is more surprising is that more than one quarter of parents (26.2%) of parents is aware that their children drink alcohol.

Adolescents in this sample mostly drink alcohol just couple of times in their lives (9%), but there are also 8.3% of those who drink with their families' couple of times per year, and 5.5% of them who drink alone couple of times per year.

Although there were only 8 respondents you said that they have tried cannabis, 7 of them are in the group that drink. The statistically significant difference between the group that drinks and does not drink alcohol exists.

The cannabis has been more frequently offered to the youngsters who drink alcohol (15.2%) compared to the 4.5% of those who does not drink. This difference is also statistically significant.

		Type of drinking		
		With family	Alone	
How often do you?	Everyday or almost every day	N	1	5
		%	.7	3.4
	Couple times per week	N	3	2
		%	2.1	1.4
	Once a week	N	1	3
		%	.7	2.1
	Once a month	N	3	6
		%	2.1	4.1
	Couple times a year	N	12	8
		%	8.3	5.5
	I drink alcohol only couple of times	N	13	13
		%	9.0	9.0
	I stop drinking	N	2	4
		%	1.4	2.8
I have never used alcohol	N	110	104	
	%	75.9	71.7	

X²= 59.485 p=0.0001

Table 10. Soul drinking and drinking with the family members

		Do you drink alcohol?			Total
			Yes	No	
			N	%	
Have you tried cannabis?	Yes	N	7	1	8
		%	4.8	.4	2,2
	No	N	138	222	360
		%	95.2	99.6	97,8
Total	N	145	223	368	
	%	39.4	60.6	100.0	

X²= 7,923 p=0,005

Table 11. Have you tried cannabis according to alcohol use

		Do you drink alcohol?			Total
			Yes	No	
			N	%	
Have you been offered to buy cannabis	Yes	N	22	10	32
		%	15,2	4,5	8,7
	No	N	123	213	336
		%	84,8	95,5	91,3
Total	N	145	223	368	
	%	39.4	60.6	100,0	

X²= 12.643 p=0.0001

Table 12. Have you been offered to buy cannabis according to alcohol use

Adolescents who drink alcohol on average have more friends that smoke tobacco, drink alcohol, use illicit drugs, have sex and get into the fights. What is interesting is that they also have more friends that exercise in their free time.

In this sample and regarding the plans for the upcoming year adolescent that drink alcohol answered that they will more often smoke tobacco, continue to drink alcohol, have a fight, drive in a car without wearing a seat belt, and drive in a car that is driven by a drunk friend. All these relations are statistically significant. Although it is not usual form of transportation in our country, adolescents that drink answered that they will ride a bicycle when drinking in 7.8%. Adolescent that drinks also in larger percent answered that they will most definitely or definitely has a sexual intercourse, as well as unprotected intercourse, and use illicit drugs.

This Table shows that relation of tobacco, alcohol and drugs among adolescents related to their parents, and other family members, was analyzed. Intention was to find hereditary predisposition for use such substances. Results of the study shows that majority of paternal side of adolescents use tobacco (84,7%), drink alcohol (80,4%), while do not use drugs at all. Maternal side of adolescents use tobacco (69,8%), significantly less drink alcohol (19,5%) while do not use drugs at all as well as paternal side. Similar results were found among other family members. While analyzing this behavior among young population it is obvious need for dental and oral expertise, in order to prevent oral hygiene and health.

4. DISCUSSION

Due to the significance of adolescent period and all the disorders that could appear in it and have lasting harmful consequences this study was conducted to determine the level of drug abuse during the mentioned period. It

	Do you drink alcohol?	N	Mean	Std. Dev.	Std. Error Mean
How many of your friends smoke tobacco, even occasionally	Yes	145	2.06	1.701	.141
	No	223	.74	1.231	.082
How many of your friends use alcohol, even occasionally	Yes	145	1.80	1.636	.136
	No	223	.44	.956	.064
How many of your friends use drugs	Yes	145	.37	.941	.078
	No	223	.04	.281	.019
How many of your friends have sex	Yes	145	.95	1.474	.122
	No	223	.18	.683	.046
How many of your friends usually get into fights	Yes	145	1.99	1.639	.136
	No	223	1.15	1.409	.094
How many of your friends exercise in their leisure time	Yes	145	2.51	1.621	.135
	No	223	2.34	1.657	.111

Table 13. Average number of friends with risk behavior

During next year will you ...	Do you drink alcohol?		X ²	p	
	Yes	No			
Smoke tobacco	N	18	2	34,996	0,0001
	%	12,4	,9		
Drink alcohol	N	21	4	83,402	0,0001
	%	14,4	1,7		
Have a fight	N	41	19	33,104	0,0001
	%	28,3	8,5		
Drive in a car without a seat belt	N	34	22	20,390	0,0001
	%	23,5	9,9		
Drive in a car that is driving a drunk friend	N	12	2	15,427	0,001
	%	8,2	,8		
Ride a bicycle drunk	N	11	2	17,520	0,001
	%	7,8	,8		
Have sexual intercourse	N	36	22	19,796	0,0001
	%	24,8	11,8		
Have a sexual intercourse without protection	N	11	8	7,099	0,069
	%	7,6	3,6		
Use illicit drugs	N	5	1	7,523	0,057
	%	3,5	,4		

Table 14. Future plans regarding risk behavior (only positive answers) according to alcohol use

	Father		Mather		Close family members		Other family members	
	yes	no	yes	no	yes	no	yes	no
Do your parents and family members drink alcohol	296 (80,4%)	72 (19,5%)	72 (19,5%)	296 (80,4%)	rarely	-	-	-
Do your parents and family smoke tobacco?	312 (84,7%)	56 (15,2%)	257 (69,8%)	111 (30,1%)	yes	-	yes	-
Do your parents and family use drugs?	-	-	-	-	no	-	-	-

Table 15. Tobacco, alcohol and drug use among parents and family members

has been approached this problem from various points, trying to discover possible causes for greater drug abuse. By identifying factors, it is possible to develop a strategy that will have preventive effects, which will bring positive results in the future.

Out of the total number of 368 participants 170 were male, 198 female, 200 aged from 15 to 17 (54.3%) years old and 168 from 12 to 14 years old (45.7%).

Our research found that, out of 598 adolescents, 15, 55% of them consumed alcohol. It was need to see what is the extent of influence of urban and rural environments, with their various characteristics, on the number of alcohol consumers. It was found that alcohol consumption was more present in urban (56.6%) than in rural areas (43.4%). A possible reason for this difference is somewhat better socio-economic status of urban communities, greater number of cafés and an overall better economic situation.

Our results coincide with the results of number of authors who conducted similar research. The authors in America, for example, have also concluded that the number of alcohol consumers is greater in big (7, 1%) than in small (7%) cities while the smallest number of alcohol consumers is found in rural areas (5, 2%) (5,6,7).

Analyzing the data, it is shown that alcohol consumption among adolescents is present more in high schools (15-17 years of age) than in elementary schools (12-14 years of age). It was also observed that age limit for first alcohol or other psychoactive substance use is lower in alcohol consumers (12 and 13 years of age). For example, the adolescents who consumed alcohol started consuming cannabis early, as a sign of tendency to use various drugs simultaneously. This research revealed the results similar to those reached worldwide.

According authors (8) it was found the alcohol consumption to be more exhibited towards the end adolescence period than younger ones.

Alcohol consumption viewed in terms of gender distribution shows that alcohol is consumed more by boys than girls (53.1% vs. 46.9%), which is similar to what other researches found (34, 8% among boys and 11, 6% among girls) (8).

Some references point to the opposite from what we found. Hence, the girls are seen to exhibit risky behavior more frequently than boys—first drinking, smoking, sexual behavior and drug abuse (9,10, 1).

According to religion 360 (97.8%) participants were Muslims, 2 (0.5%) Orthodox, 2 Catholics (0.3%), and other

1 (0.8%). Out of the total number of participants, 95 (25.8%) smoked tobacco; 145 (39.4%) consumed alcohol, and 8 (2.2%) used cannabis.

One of objective of this research was to explore the relation between alcohol consumption and religious practice. Out of the total number of participants who consume alcohol 55 (37.9%) go to mosque/church regularly, and 90 (62.1%) do not practice religious rituals, with

highly significant difference. This could be explained by the fact that religion has strong impact on adolescents' consumption of alcohol. Similar results were found by authors Akabaliev V. and Dimitrov I. in their two studies done in 1996 and 1997 (12,13), as well Marks 2004 (14). The sample of these studies involved Christians-Bulgarians and Muslims-Turks. A definite trend has been found towards earlier first contact and beginning of regular use of alcohol in both ethnic groups, but it is more clearly defined with the Turks. As a whole, Turkish ethnic identity and identification with Muslim religious values and beliefs restrict the Turks in their contact with alcohol and are still significant factors in restraining from alcohol use in their community. Their cultural readiness to say "No" to alcohol is viewed in the context of the abstinent Islamic culture.

One of the variables was observed is tendency to use various psychoactive substances simultaneously (smoking, drinking, use cannabis). Drugs more often offer to this group of adolescents, as well. This is observed by other world authors, who also concluded that smoking and drinking play a role in drug abuse (15).

This research also examined the aspect of friendship and its influence on adolescents. It is conspicuous that a young individual who consumes alcohol very often has two or three friends who have the same habit, while a young person who does not consume alcohol has no such friends. The influence of a group on an individual proved to be very significant when it comes to frequency of harmful substances abuse. What we found is identical to what the other authors had found—type of a group an adolescent is a member of as well as the group's stance on narcotics use is indeed crucial (16,17).

The surprising fact in this research was the parents' stance once they learned of their children's' alcohol consumption (they know, they do not know, they allow it or they do not allow it). In 26.2% cases parents are aware of the drinking, while in 10.3% cases are not. Similar data are found in literature (18). Less parental and friends support is directly connected with increase risk for substance abuse (19). Genes are more active among youngsters who are more isolated from family and society (20).

This research did not observe impact of chromosome among adolescents, abut it is worldwide known that chromosome 7, named CHRM2 could have produce drug and alcohol abuse, but could decrease drug abuse as well. (19, 21, 22). Adolescents whose family members use psychoactive substances could develop such behavior during

lifetime, as well (19,20). Treatment is multidisciplinary, but support from family, peers and society is very much important as well (23,24,25,26).

Youngsters who abuse alcohol and other psychoactive substances tend to have the same behavior in the future.

The results of our research might point out the most important problem in the planning of strategy of the preventive programs related to the risky behavior in young people.

5. CONCLUSIONS

- ▶ Alcohol abuse is more present in urban rather than in rural types of communities. (56.6%; 43.4%; $p=0,0001$).
- ▶ Of all age groups examined, alcohol abuse is most frequent in high school age group, 69.0%; 31.0%.
- ▶ Alcohol use is more frequent in males (53.1%; 46.9%)
- ▶ Youngsters who use alcohol have higher average body weight, height and BMI score compared to non drinkers.
- ▶ Adolescents who abuse alcohol more often smoke tobacco and use cannabis than compared with others who do not drink.
- ▶ Religion has strong impact on adolescents' consumption of alcohol.
- ▶ Passive parental support to alcohol consumers is surprisingly high, > 50%.
- ▶ It is highly likely that an individual will acquire characteristics of a group he/she associates with (he/she will start with consumption of one or more harmful substances, if consumption of those substances is practiced by that particular group).
- ▶ Impact of hereditary factors among adolescents, parents and other family members related to drug abuse were not approved. Paternal side of adolescents were tobacco smokers more often, but this is not significant that it is hereditary related. Therefore hereditary predisposition for this kind of behavior among adolescents is negative.
- ▶ All these mentioned above has significantly consequences on quality of life. Therefore there is need for multidisciplinary approach to this problem to include medicine, genetic and dental experts.

REFERENCES

1. Loga, S. Klinička psihijatrija. Sarajevo/Tuzla: Medicinski fakultet, 1999: 151-79.
2. WHO: The ICD-10 Classification of Mental and Behavioural Disorders: Clinical Description and Diagnostic Guidelines, Geneva, 1992.
3. Berg-Kelly K, Kullander K. Do Adolescents' Own Intentions Regarding Healthy Behaviors Affect Outcome? - A Two Years Prospective Study. *Acta Paediatrica*. 1999;88:983-9.
4. Dean AG, Dean JA, Burton AH, Dicker RC. Epi Info. A Word Processing, Database, and Statistics System for Epidemiology on Microcomputers (computer program). Atlanta, Georgia, USA and Geneva, Switzerland: Centre for Disease Control and World Health Organization, 1990.
5. Henderson P. Drugs Prevention in Rural Areas: An Evaluation Report. Home Office Drugs Prevention Initiative Paper 17. London: Home Office, 1998.
6. Cobb B, Cairns B, Miles M, Cairns RA. Longitudinal Study of the Role of

- Sociodemographic Factors and Childhood Aggression on Adolescent Injury and "Close Calls". *J Adolesc Health*, 1998; 17: 381-8.
7. Baumrid DA. Developmental Perspective on Adolescent Risk - Taking in Contemporary America. Vol 37 San Francisco: Jossey-Bass, 1997.
8. Chester JA, Barrenha GD, Hughes ML, Keuneke KJ. Age and sex-dependent effects of footshock stress on subsequent alcohol drinking and acoustic startle behavior in mice selectively bred for high-alcohol preference. *Alcoholism Clinical and Experimental Research*, 2008;32(10):1782-94.
9. Moller-Leimkuhler AM, Schwarz R. et al. Alcohol dependence and gender role orientation, *European Psychiatry, The Journal of the Association of European Psychiatrists*, 2002; vol.17- No. 1.
10. Magnusson D, Stattin H, Allen V. Differential Maturation Among Girls and its Relations to Social Adjustment: A longitudinal Perspective, *J Clin Psychiatry*, 1999: 49: 3-6.
11. Derringer J, Krueger RF, McGue MI, William G. Genetic and environmental contributions to the diversity of substances used in adolescent twins: a longitudinal study of age and sex effects. *Addiction*, 2008,103,10:1744-51.
12. Akabaliev V, Dimitrov I. Ethnic and religious identity and some age characteristics of alcohol use. *Folia Med (Plovdiv)*. 1996;38(3-4):5-10.
13. Akabaliev V, Dimitrov I. Attitudes towards alcohol use among Bulgarians-Christians and Turks-Muslims. *Folia Med (Plovdiv)*. 1997;39(1):7-12.
14. Marks L. Sacred practices in highly religious families: Christian, Jewish, Mormon, and Muslim perspectives. *Fam Process*. 2004 Jun;43(2):217-31.
15. Johnson PB, Boles SM, Kleber HD. The Relationship Between adolescent Smoking and Drinking and Likely Estimates of Illicit Drug Use. *J Addict Dis*; 19(2),2000:75-81.
16. Berg-Kelly K, Alven B, Erdes L, Erneholm T, Johannisson I. Health Habits and Risk Behavior among Youth in Three Communities with Different Public Health Approaches. *Scand J Soc Med*. 1997;25:149-55.
17. Jackson C, Dickinson D, Henriksen L, Levine DW. The Early Use of Alcohol and Tobacco: its Relation to Children's Company and Parents' Behaviour. *Am J Public Health*, 1997, Mar; 87(3),359-64.
18. Lloyd C, Griffiths P. Editorial: Problem for the Future? Drug Use Among Vulnerable Groups of Young People. *Drugs: Education, Prevention and Policy*. No 5, 1998: 213-16.
19. Beaver KM. Nonshared environmental influences on adolescent delinquent involvement and adult criminal behavior. *Criminology*, 2008;46, (2):341-69.
20. Rowe R, Simonoff E, Silberg JL. Psychopathology, temperament and unintentional injury: cross-sectional and longitudinal relationships. *Journal of Child Psychology and Psychiatry and Allied Disciplines*, 2007: 48: 71-9.
21. Guo G, Roettger ME, Cai T. The Integration of Genetic Propensities into Social-Control Models of Delinquency and Violence among Male Youths. *American Sociological Review*, 2008;73 (4):543-68.
22. Hicks BM, Bernat E, Malone SM, Iacono WG, Patrick CJ., Krueger RF, McGue, M. Genes mediate the association between P3 amplitude and externalizing disorders. *Psychophysiology*, 2007: 44: 98-105.
23. Shikishima C, Ando J, Ono Y, Toda T, Yoshimura K. Registry of Adolescent and Young Adult Twins in the Tokyo Area. *Twin Research and Human Genetics*, 2006;9(6):811-6.
24. Lorenz JG, Long JC., Linnoila M, Goldman D, Suomi SJ., Higley J. Genetic and Other Contributions to Alcohol Intake in Rhesus Macaques (Macaca mulatta). *Alcoholism Clinical and Experimental Research*, 2006; 30 (3):389-98.
25. Rowe R, Simonoff E, Silberg JL. Psychopathology, temperament and unintentional injury: cross-sectional and longitudinal relationships. *Journal of Child Psychology and Psychiatry and Allied Disciplines*, 2007: 48: 71-9.
26. Meyer Paul J, Meshul Charles K, Phillips Tamara J. Ethanol-and cocaine-induced locomotion are genetically related to increases in accumbal dopamine. *Genes. Brain & Behavior*, april 2009;8(3):346-55.

Corresponding author: Prof Ifeta LicaninMD, PhD. Psychiatric clinic. Clinical center of Sarajevo University. Sarajevo, Bolnicka 25. Tel.: 00 387 33 297 000.
