Risk factors and protective factors for adolescent substance use

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The aim of the research was to examine the possible risk or protective role of the selected individual, school, family and peer variables in adolescent substance use and to determine the differences in the contribution of these groups of variables in explaining adolescent substance use. The study was carried out on a representative sample of 723 high school students from Mostar, 370 girls (51%) and 353 boys (49%), aged 14 to 20 (the mean age 16.77 years). The research included individual, school, family, peer, and socio-demographic variables. Hierarchical regression analyses were conducted with cigarettes smoking, alcohol consumption and drug use as criteria. Abovementioned groups of variables explained 42% of the variance in cigarette smoking (in the last 30 days), 54.5% of the variance in alcohol consumption and 45.7% of the variance in drug use. In all of the three cases peer variables were among does explaining the most variance. The number of household substance users, father's alcoholism, truancy and perceived peer substance use were determined as risk factors, while ability to manage and regulate emotions, religious beliefs, importance of faith and components of authoritative parenting style (parental monitoring and parental support) as protective factors. The results are discussed according to the theoretical models that emphasize the influence of multiple risk and protective factors for substance use.

Key words: prevention, substance use, risk factors, protective factors

Despite the fact that legal and illegal drugs have been known and abused for centuries, and professionals have struggled and fought the problem of substance abuse almost equally as long, it still seems that satisfactory solution to the problem is lacking. Growing recognition of the long duration of the treatment (influenced by relapses, among other factors) and with it connected high costs, and of the inability of existing treatment programs to keep up with the increasing number of patients, have stimulated interest in primary prevention of substance use and abuse. Concepts related to risk and protective factors have been useful in explaining a number of serious health problems (cardiovascular disease, cancer, HIV etc.) and substance use disorders.

Serious efforts at extending risk factor models to the drug abuse arena began in the early 1980s. Bry and colleagues (Bry, 1983; Bry & Krinsley, 1990; Bry et al., 1982, 1988; as cited in Pandina, 1996) were among the first ones

to demonstrate the importance and applicability of risk factor models in predicting drug use susceptibility. Their work was later extended and refined by the work of Newcomb and colleagues (Newcomb, 1995; Newcomb & Felix-Ortiz, 1992).

Large number of variables has been studied in order to determine best predictors of the use of psychoactive substances. The work of Hawkins, Catalano and Miller (1992) reviewed over 140 empirical studies which have determined risk factors for adolescent drug use. They found 17 such risk factors, which can be roughly divided into two categories: a) cultural and societal (i.e. contextual) factors and b) individual and interpersonal factors.

For the purpose of this study classification of risk factors from work of Catalano, Haggerty, Gainey, Hoppe and Brewer (1998) (excluding the factor No. 4 not stated by Hawkins et al., 1992) has been considered as main classification, which includes: a) environmental factors (availability of drugs, laws and norms favorable towards drug use, extreme economic deprivation, high rate of transition, mobility and neighborhood disorganization); b) family factors (alcoholism in family history, poor and inconsistent family management practices, parental substance use and favorable attitudes towards substance use and family conflict); c) school factors (academic failure and low degree of commit-

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ment to school); d) individual and peer factors (constitutional factors such as psychophysiological susceptibility to the effects of drugs, peer rejection (in elementary school), early and persistent problem behavior, alienation and rebelliousness, association with drug-using peers, attitudes favorable towards drug use, early onset of drug use).

The drug abuse research (National Institute on Drug Abuse [NIDA], 2002) identified some protective factors, most important of which are: a) strong and positive family bonds, b) parental monitoring of children's activities and peers, c) clear rules of conduct that are consistently enforced within the family, d) involvement of parents in the lives of their children, e) success in the school performance, f) strong bonds with institutions such as school and religious organizations and g) the adoption of conventional norms about the drug use.

At the current level of insight in this area it is considered that adolescent drug involvement is determined in more than one way (Newcomb, 1995). The central concept is that risk and protective factors are cumulative in their impact. This means that the greater the number of risk factors the higher the susceptibility to use and abuse of psychoactive substances. Conversely, the accumulation of protective factors reduces the likelihood of negative outcomes. The balance of risk and protective factors is still not clear enough. Some preliminary investigations (Hancock, 1996; as cited in Pandina, 1996) indicate that risk and protective factors may behave somewhat differently in influencing susceptibility. The protective factors appear to be more important for long-term use patterns and cumulative outcomes, while the risk factors are more important for short-term, more immediate use patterns and such outcomes. Certain groups of factors may be more influential in producing or limiting susceptibility in different developmental (Pandina, 1996).

Adolescence is the period of transition from childhood to adulthood during which one reaches a new phase of psychosocial development. The onset of tobacco use, alcohol use and psychoactive drug use usually begins during the adolescence, and because of its particularities, i.e. growing up, relative inexperience and certain youthful tendencies towards risks, adolescent population is the most susceptible to psychoactive substances use and abuse (Sakoman, Raboteg-Šarić, & Kuzman, 2002).

Since one may be at various stages of drug use (use, abuse and addiction), distinctive factor constellations may be responsible for the progression to a particular stage of use. Thus, factors important in earlier stages of the psychoactive substances use (such as initiation or trying) may differ qualitatively and quantitatively from those related to the transition to a stage of addiction. Research has demonstrated that many factors (both, risk and protective) can and do change across time in many individuals.

Two problems might be at the core of the lack of success of the often used preventive activities. First, only a few programs target the right sets of mediating variables (risk and protective factors). Second, programs addressing the variables with a strong potential to mediate drug use are not sufficiently successful in influencing and changing these variables (Hansen, 1996).

Earlier prevention programs have focused on only one variable domain (individual, peer group, family, school or community). However, recent research pointed to an increase in effectiveness of preventive activities when they focus on more than one domain at the same time, resulting in the preference for the all-inclusive preventive strategies. However, professionals involved in prevention are aware of the fact that no program or method can completely eliminate substance abuse. In most countries, the focus is on the prevention of illicit drug use, but research suggest that effective prevention of illegal drug use starts with the prevention of cigarettes use and alcohol consumption. Therefore, this study considers the use of various illicit drugs, but also of cigarettes use and alcohol consumption, which will prove to be particularly useful in analyzing levels and patterns of consumption.

The risk and protective factors were selected according to the above listed classification and taking into account that at least one of the factors is selected from each domain: individual characteristics, family, peers and school. Factor selection was also influenced by the availability of psychological instruments for measuring some of the variables, as well as the possibility to influence and change certain factors through preventive actions which could result in the election of more malleable factors.

The domain and factor selection is in line with the theory of primary socialization by Oetting and Donnermeyer which explains the role of family, school and peers in the development of the substance abuse behavior in adolescents (Sakoman, Brajša-Žganec, & Glavak, 2002). The listed authors recognize family, school and peers as the primary sources of socialization.

A few treatment possibilities are accessible in Mostar region considering alcohol and/or drug abuse and addiction, such as treatment in the Psychiatric Department, at the Center for Outpatient Treatment, in a therapeutic community and one commune in Herzegovina. Considerable availability of drugs is present due to inefficiencies and insufficient integration of legal system. This results in substantial problems in prosecution of those responsible for sale and re-sale of drugs. Availability of cigarettes and alcohol for adolescents is even greater. Although there are laws prohibiting their sale to minors, these laws are often neglected. Systematic, comprehensive and long-term preventive actions are currently not present in Bosnia and Herzegovina. Short-term preventive programs have been implemented at the level of local community in recent years, mostly aimed at raising public consciousness about the problem, and educating young people about psychoactive substances, as well as several programs of peer education.

A few investigators have attempted to develop a more integrated framework of adolescent substance use by examining variables in all four domains, while very few of them have examined the relationship between emotional competency and adolescent substance use. Therefore, the main goal of this study was to investigate the relationship between the selected individual, family, school and peer variables and substance use, and to consider risk or protective roles of these variables in adolescence. The study is based on the model of multiple risk and protective factors (Newcomb & Felix-Ortiz, 1992; Newcomb, 1995). Another aim was to determine the differences in the contribution of groups of variables from the four domains in explaining substance use. The basis for including these groups of predictor variables in the hierarchical regression analyses was the social interactional model developed by Patterson and colleagues (Dishion, Patterson, Stoolmiller, & Skinner, 1991). Until yet, this type of study has not been conducted in Bosnia and Herzegovina and the intention was to determine whether adolescents from Mostar region (or Bosnia and Herzegovina) differ in factors related to substance use from the adolescents in the other countries and regions. The results of this study should provide assistance in creating preventive programs for substance use in this region.

METHODS

Participants

The research was carried out on 723 participants, representing 10% of the high school attendees in Mostar. The mean age of the respondents was $M= 16.77$ years ($SD = 1.22$, range 14-20). The sample was stratified by religious affiliation, type of school and school grades. There were four steps in creating this sample. In order to facilitate further stratification two separate samples were created according to religious affiliation. The reason for this first step is the post-war parallel existence of two separate school systems caused by the political situation in the Mostar region (one school in the eastern predominantly Bosnian part, the other in western predominantly Croatian part). The subsamples were created so that high schools from each of the two parts would be represented proportionally to its share in the total population of the high school students. Implicitly, the proportional representation of participants from the two most numerous religion communities have been ensured, without hampering participation of members of other religion communities. Second step was based on determining the number of students from each grade (first, second, third and fourth grade). In the third step we considered the type of school according to the following classification on: a) three-year long, b) four-year long and c) gymnasium. Within a specific grade, the number of students from the particular type of school depended on their share in the defined population of

high school students. Fourth step included random selection of schools from the list of schools of the same type, including specific classes from the school. The basic unit of the selection was a class, and not an individual due to technical reasons. At each level 10% of the defined population was selected, i.e. total number of participants was 10% of the total number of high school students from the Mostar region. A larger number of participants was necessary due to the relative rarity of substance use (especially illegal drug use) in the overall adolescent population level.

Measures

Socio-demographic variables were gathered with the questionnaire covering participants' gender, age and religious affiliation; family structure (i.e. with whom does the adolescent lives) and socio-economic status operationalized by mother's and father's level of education. These variables were included so their impact and possible suppressive effect could be controlled for. Socio-demographic variables were gathered according to the work by Newcomb (1995), while religious affiliation was selected due to the specifics needs of this study.

Substance use was assessed using the measures taken from the United States national study "Monitoring the Future", carried out yearly since 1975 on representative samples of high school students, university students and young adults (Johnston, O'Malley, & Bachman, 2002). A standard set of three questions is used to determine usage levels for the various psychoactive substances; in this study for the various illegal drugs (marijuana, hashish, heroin, cocaine, other opiates, amphetamines, ecstasy, LSD, sedatives and inhalants) and alcohol. Three usage levels are: a) ever in life, b) during the past 12 months and c) during the last 30 days. Answers to each of the three questions are given on the same scale: "not once", "1-2 occasions", "3-5 occasions", "6-9 occasions", "10-19 occasions", "20-39 occasions" and "40 or more occasions". Cigarette use was assessed by two questions: "Have you ever smoked cigarettes?" (answer given on the same scale as the one above) and "How frequently have you smoked cigarettes during the past 30 days?" (the answer categories are "not at all", "less than one cigarette per day", "1-5 cigarettes per day", "about half a pack per day" and "one or more packs per day").

Strong positive correlations were found between the three illegal drug use measures were found (in range from .59 to .90) and between three alcohol consumption measures (in range from .69 to .91), and for this reason two 3-item composite scores were formed, i.e. total alcohol use and total illegal drug use. This served in reducing the measurement error (Stacy, Ames, Sussman, & Dent, 1996). Higher result meant more frequent illegal drug use or alcohol consumption. Both composite measures had a good reliability, i.e. Cronbach's alpha was $\alpha= .81$ for total illegal drug use and $\alpha= .92$ for total alcohol use. Although, predictors for differ-

ent types of drug use can be different to some extent (especially distinguishing marijuana from other drugs), the use of composite drug use measure seemed justified due to some practical reasons. These reasons are related to the potential implementation of partial preventive programs or programs aimed at preventing the use of only one type of drug. As expected marijuana use explained the most variance in such composite measure of drug use, but sedatives contributed considerably as well. Therefore, a composite drug use measure seemed to be a more sound solution.

The correlation between the two cigarettes use measures, i.e. between cigarettes use ever in life and cigarettes use during the last 30 days, was $r = .77$. Only cigarettes use during the past 30 days was used as the criterion variable in the regression analysis.

Emotional intelligence (competence) was measured by *Emotional Intelligence, Skills and Competences Questionnaire* (EISCQ) (Takšić, 2001) consisting of 45 items. This questionnaire is a shorter version EISCQ-136 consisting of 16 subscales (Takšić, 1998; Takšić, Jurin, & Cvenić, 2001). EISCQ-136 was constructed according to the model of emotional intelligence by Mayer and Salovey (Salovey & Sluyter, 1997). The main reason for the construction and the use of shorter scale in this study was its practicality and possibility of the use in the time-restricted conditions. EISCQ contains 3 subscales: a) the ability to Perceive and Understand emotion (15 items), b) the ability to Express and Label emotion (15 items) and c) the ability to Manage and Regulate emotion (15 items) (Takšić, 2002). Participants were asked to rate the extent to which each of the statements is accurate for them ("1-not at all", "2-mainly not", "3-at times", "4-mainly yes", "5-completely"). The reliabilities were as follows: the ability to Perceive and Understand emotion $\alpha= .86$, the ability to Express and Label emotion $\alpha= .85$, the ability to Manage and Regulate emotion $\alpha= .74$, and for the complete scale EISCQ $\alpha= .91$. These values of Cronbach alpha coefficients are consistent with data from previous studies and satisfactory of this research.

Religiosity is measured by multidimensional scales in order to identify multiple dimensions of individual religious beliefs and practices as good as possible. Therefore, religiosity was measured by the *Religiosity questionnaire* (Ljubotina, 2004). It is comprised of 19 items, which measure two dimensions of the religiosity: a) religious belief and b) ritual religiosity. First dimension named "religious belief" concerns religiosity demonstrated at spiritual level through internalized beliefs and emotions, regardless of religious affiliation or behavior (e.g. "I believe in life after death"). Second dimension named "ritual religiosity" concerns the degree to which individual performs religious rituals established by religious community to which he/she belongs and mostly relates to the behavioral level (e.g. "I go to church (temple of God) regularly"). Subscales measuring religious beliefs consists of 10 items, and subscale measuring ritual dimension consists of 9 items. The results

are coded on scale, ranging from 0 to 3. Subject indicated to what extent each of the statements applies to her/him. For the purpose of this research, the original version of questionnaire intended for Christian religion was adapted in its content and parallel version for Islamic religion was developed. The change of content was minimal with only a few terms adjusted to correspond to Islamic religion. The reliability of Religiosity questionnaire is $\alpha= .93$ for the whole sample, and identical reliability values were found in both of the subsamples. Reliability of the religious beliefs subscale for the whole sample was $\alpha= .88$; $\alpha= .88$ for the Christian (original) and $\alpha= .87$ for the Islamic version. Reliability of the ritual dimension subscale of religiosity for the whole sample was $\alpha= .89$; $\alpha= .89$ for Christian (original) and $\alpha= .90$ for Islamic version. Almost identical correlation coefficients were obtained between the subscales and the complete scale (Religiosity questionnaire) in both subsamples (.73, .93 and .93 toward .73, .92 and .94). Therefore, it was justified to consider the results on these scales at the level of the whole sample. This is also supported by the results of the factor analyses obtained on the Religiosity questionnaire for subsamples, as well as for the whole sample.

The importance of faith was measured on the scale ranging from 1-7 and only extreme values were described with the statements, i.e. 1-"not important at all" and 7-"extremely important".

The onset of substance use was assessed separately for cigarettes, alcohol, marijuana and other drugs (common measure for hashish, heroin, cocaine, other opiates, amphetamines, ecstasy, LSD, sedatives and inhalants). Participants answered the questions "How old were you when you first ....a)....started to smoke cigarettes (not counting taking only one smoke), b)...started to drink alcohol (not counting small tastes or sips of alcohol), c)...tried marijuana , d)...tried other drugs (hashish, heroin, cocaine, other opiates, amphetamines, ecstasy, LSD, sedatives and inhalants). Subjects choose one of the following answers: (a) 11 years or younger, b) 12-13 years, c) 14-15 years, d) 16-17 years, e) 18 years or older, f) have not tried/ started to use. This measure was constructed according to the onset of alcohol consumption measure used in 1992 National Longitudinal Alcohol Epidemiologic Survey (National Institute on Alcohol Abuse and Alcoholism [NLAES], 1998).

Academic failure was measured by the number of negative marks in the previous semester. Participants chose one answer among the following: a) none, b) one and c) two or more.

School achievement was measured by the average success at the end of the previous semester (range 1 to 5).

Truancy can be considered as an indirect behavioral indicator of commitment to school. The participants were asked about the number of unjustified absences they had in previous semester with these possible answers: a) none, b) from 1 to 5, c) from 6 to 10, c) from 11 to 15 and e) more than 15.

Educational aspirations represent the intention to continue education by attending the University ("yes" or "no" answers).

Family substance use was assessed for each family member separately (father, mother, sister, brother), with separate measures for cigarette use, alcohol consumption and illegal drug use ("yes" or "no" answers). For the purpose of the data analyses, three new measures were formed according to the type of substance: number of household cigarette users, number of household alcohol users and number of household drug users.

Parental alcoholism was assessed by the measure adapted from the National Longitudinal Alcohol Epidemiologic Survey in USA in 1992 (NLAES, 1998). The question "In your judgment, have your blood or natural parents been alcoholic or problem drinker at any time in their life?" was followed by a clear description of a criterion which must be met for providing a correct answer to this question ("yes" or "no" answer). Separate evaluation was given for one's father and one's mother.

Parental monitoring, parental support and joint decision-making in the family were measured by the *Parental child rearing practices scales* (Raboteg-Šarić, Franc, & Brajša-Žganec, 2004). Separate evaluation was given for one's father and one's mother on three scales.

Parental monitoring scale is comprised of 5 items measuring adolescents' experience about the extent to which their parents are informed about their everyday activities. The initial question "How much do your parents really know?" is followed by the items. The results are coded on a 3-degree scale (1-"do not know", 2-"know little", 3-"know a lot"). In our study reliabilities were α= .74 (mother) and α= .77 (father).

Parental support scale has 8 items. Adolescents have to state to what extent they perceive their parents as persons who readily respond to their needs and who encourage those using rewards and praises. The initial question "To what extent does each of the statements apply to your father and mother?" is answered on a 3-degree scale (1-"mostly not true", 2-"somewhat true", 3-"mostly true"). In this research, reliabilities are α= .74 (mother) and α= .77 (father).

Joint decision-making (in family) scale has 4 items and measures parents' tendency to include children in decision-making about the important matters in their life, instead of making one-sided decisions. The participants answered on a 3-degree scale (1-"mostly not true", 2-"somewhat true", 3-"mostly true"). In this research, reliability was α= .68 (mother) and α= .71 (father).

Peer substance use was measured separately for cigarettes, alcohol, marijuana and other illegal drugs. Subjects answer how many of their friends use certain substance on 5-degree scale (1-"none", 2-"a few of them", 3-"almost half of them", 4-"more than half of them", 5-"almost all of them"). Four separate measures of substance use were formed (peers' use of cigarettes, peers' use of alcohol, peers' use of marijuana and peers' use of other illegal drugs).

Procedure

The research was carried out among high school students in Mostar region in May 2003 (academic year 2002/2003). Students were asked to fill out the questionnaires in their classrooms. The questionnaire administration lasted for about one class period (approximately 45 minutes).

Students were told that the participation is voluntary and they were assured (in oral and written form) that their data would remain anonymous. The questionnaires were completed under the supervision of the researcher, and the teachers were not present in order to increase confidentiality and anonymity. According to Murray and Perry (1987; as cited in Wills, Yaeger, & Sandy, 2003) methodological research has shown that when participants are assured of confidentiality, self-reports of substance use have good validity.

Questionnaires were presented to all of the participants in the same order. Socio-demographic variables were measured first in order to slowly and carefully introduce subjects to the sensitive topics. Questions concerning substance use rely on remembering experiences from recent or distant past and therefore require good concentration. As we can assume that concentration is better at the beginning, questions concerning substance use were administered right after the questions on socio-demographic variables.

Data analysis

Since a great number of selected variables correlated with substance use (Table 2), data analysis included multiple regression analysis to determine the best predictors of adolescent substance use behavior. Correlation matrix showed that the results on the complete EISCQ scale were not correlated with substance use, while results on subscales were correlated. Because of this EISCQ subscales were included as predictors in regression analysis. Similarly, the religiosity subscales were included as predictors due to the possibly different contribution of the dimensions of religiosity in predicting substance use. Among socio-demographic variables only religious affiliation was excluded from the regression analysis, as it is nominal scale variable. The variables relating to the onset of substance use (cigarettes, alcohol, marijuana, other drugs) could have been considered only for the part of the sample (individuals who used certain psychoactive substance at least once). Therefore they were not included in this part of statistical analysis. Family substance use was initially measured separately for family members. However, to avoid significant decrease of the sample due to the regression analyses three composite measures of the number of household users were formed. Although, parental alcoholism was separately measured for father and

mother, mother's alcoholism was excluded from the statistical analyses because none of the participant stated his/her mother was alcoholic. Although previous studies (Denton & Kampfe, 1994; Barber et al., 1988; Dakof, 2000; as cited in Brajša-Žganec, Raboteg-Šarić, & Glavak, 2002) of family variables as predictors of cigarette use, alcohol consumption or illegal drug use during adolescence showed a slightly different structure of these relationships among the samples of adolescent boys and girls, data were not analyzed separately. As preventive programs for substance use usually include both genders and our secondary aim was to create such preventive program for the Mostar region, data analyses were conducted for the overall sample. Statistical analyses were conducted on the whole sample, and not on the subsamples based on religious affiliation, because it would be unreasonable to create separate preventive programs for adolescents from different religious affiliation in the same city. Also, it is assumed that there are no such differences in the lifestyle of participants of Catholic and Islamic religious affiliation in Mostar region that would show different importance of certain predictors in relation to criterion variables.

In each analysis, socio-demographic variables were included in the first step, while sets of predictor variables were entered to multiple regression equation in the next steps. We used the social interactional model developed by Patterson and colleagues (Dishion, Patterson, Stoolmiller, & Skinner, 1991) as the basis for entering these sets of predictor variables. According to this model, the first stage of developmental process underlying child antisocial behavior begins with the maladaptive parent-child interaction patterns. The more extreme these parent-child exchange patterns are, the more likely the child's antisocial disposition spills over to other settings, such as school. The second stage represents failure in school and in the conventional peer group. The third stage is that the disliked and antisocial child quite naturally selects a social setting which maximizes the social reinforcement. In this way, peer-group settings are established which may actually encourage the child's antisocial behavior or model and shape new forms of problem behavior. According to this model, the introduction of the sets of predictor variables is as follows: 1) socio-demographic variables, 2) individual variables (three components of emotional competence, two dimensions of religiosity, importance of faith), 3) family variables, 4) school variables and 5) peer variables. Three hierarchical regression analyses were conducted separately (cigarette use, alcohol consumption and illegal drug use).

Hierarchical regression analyses included a large number of variables and only participants with results in all variables were included in analyses, which caused a reduction in sample size. The analyzed sample consisted of 583 participants with cigarettes use (during the last 30 days) as criteria, 581 participant with alcohol use and 584 participants with drug use as criteria. However, comparing correlations of predictor variables and criterion variables with the results of hierarchical regression analyses it seems that certain reduction

in sample size did not cause any unexpected results. In other words, results of the correlations are in accordance with the results of regression analyses in terms of their direction and importance of the influence of predictor variables.

RESULTS

Prevalence of substance use

Alcohol consumption was the most widespread, followed by cigarettes smoking, and drug use as the least. In their lifetime 75.9% of high school students had consumed alcohol at least once, 66.8% during the past year and 55.4% during the last 30 days. Of all respondents, 70.4% smoked cigarettes at least once in their lifetime and 41.5% in the last 30 days. Also, 27.8% of the students had sometimes tried drugs, 20.9% during the past year and 10% in the last 30 days.

Among different types of drugs, marijuana and sedatives are most frequently used. At least once in their lifetime had 18.5% of the students consumed marijuana, 13.1% sedatives, 4.4% inhalants, 3.6% hashish, 3.3% ecstasy, 2.2% amphetamines, 1.2% cocaine, 1% LSD, 0.6% other opiates, and 0.3% heroin. During the past year 13.6% of the students consumed marijuana, 9.3% sedatives, 2.5% ecstasy, 1.8% inhalants, 1.8% hashish, 1.5% amphetamines, 0.8% cocaine, LSD 0.8%, 0.4% other opiates, and 0.1% heroin. During the last 30 days 6.5% of the students consumed marijuana, 3.7% sedatives, 0.7% ecstasy, 0.6% inhalants, 0.4% hashish, 0.3% amphetamines, cocaine, LSD and other opiates 0.1%, while none has consumed heroin.

Regression analyses

The arithmetic mean and standard deviation of the composite measures were 32.37 and 6.61 for drug use; and 9.51 and 5.77 for alcohol use. The cigarettes use during the last 30 days had arithmetic mean 2.10 and standard deviation 1.50. The normality of distribution was assessed with the Kolmogorov-Smirnov test, with the statistically significant positive asymmetry of the results for all three criteria variables ($p < .001$).

Hierarchical regression analysis for cigarette use (during the last 30 days) as dependent variable produced a statistically significant coefficient of multiple correlation, $F(29, 554) = 13.81$, $p < .001$, and accounted for 42% of the variability in cigarette use. All blocks of predictor variables contributed significantly and independently to explanation of the variance in cigarette use (during the last 30 days). As shown in Table 1, the results of the first step of the regression equations reveal that the set of five socio-demographic variables accounted for a significant increment in $R^2 = 2.5\%$ for cigarette use. Among socio-demographic variables only

age was a significant predictor (β= .14), suggesting that older adolescents smoked cigarettes more frequently. Controlling for the influence of socio-demographic variables, at the second step of the regression analysis, ability to manage and control emotions was a significant predictor (β= -.17) of the dependent variable. Low development of this ability in adolescents was associated with more frequent smoking and in this case it represented a protective factor. It seems that the ability to perceive and understand emotion plays the role of a suppressor variable because regression coefficient was significant (β= .12), while correlation between this ability

and cigarette use (during the last 30 days) (r = .04, p> .05) was insignificant. The set of individual variables explained R^2=3.4% of the variance. The set of family variables entered at the third step explained additional R^2=11.2% of the variance of cigarette use. In this case, significant predictors were the number of household cigarette users (β= .19), father's monitoring (β= -.17) and number of household alcohol users (β= .08). Father's monitoring was a protective factor, while the number of household cigarette users and number of household alcohol users were risk factors. When considering the results of hierarchical regression analyses, the fact

Table 1

The results of the hierarchical regression analyses with the predictor variables for cigarette use, alcohol consumption and drug use as criteria variables for adolescent sample

Steps	Variables	Cigarette use		Alcohol consumption		Drug use	
		β	δR²	β	δR²	β	δR²
1. socio- demographic			.025**		.169***		.061***
	gender	.06		- .32***		- .09*	
	age	.14***		.15***		.14***	
	family structure	.04		- .01		.01	
	father's level of education	- .01		.08		.06	
	mother's level of education	- .01		.16***		.14**	
2. individual			.034**		.065***		.060***
	manage and regulate emotion	- .17**		- .22***		- .07	
	perceive and understand emotions	.12*		.11*		.04	
	express and label emotion	.02		.02		.02	
	religious beliefs	- .02		- .16**		- .04	
	ritual religiosity	- .07		.04		- .05	
	importance of faith	- .05		- .04		- .18**	
3. family			.112***		.123***		.120***
	number of household cigarette users	.19***		.05		.08*	
	number of household alcohol users	.08*		.23***		.02	
	number of household drug users	- .07		.00		.16***	
	father's alcoholism	.07		.01		.09*	
	mother's monitoring	- .10		- .09		- .19**	
	mother's support	- .02		.14*		.02	
	decision-making with mother	- .02		- .11		- .08	
	father's monitoring	- .17*		- .16**		- .11	
	father's support	- .08		- .15*		- .08	
	decision-making with father	.11		.10		.12	
4. school			.142***		.032***		.021**
	school achievement	- .14*		.08		.13	
	academic failure	- .04		.08		.13	
	truancy	.33***		.20***		.13**	
	educational aspirations	- .11**		.05		.08	
5. peer			.106***		.156***		.195***
	peer cigarette use	.33***		.00		- .06	
	peer alcohol use	.02		.44***		- .00	
	peer marijuana use	.12**		.13***		.37***	
	peer other drug use-s	- .18***		- .07*		.23***	
Total		R= .648	R²= .420	R= .738	R²= .545	R= .676	R²= .457

Note. β- standard regression coefficients, δR²- change in explained variance after entering a new set of variables, s – suppressor variable.

p<.05, **p*<.01, ***p*<.001.

that only certain variables make statistically significant predictors does not necessarily mean that other predictor variables have no importance. This is especially the case when some predictor variables are in a significant correlation. The fact that some make significant predictors and some do not, can be caused by the fact that they explain the same part of variance of criterion. For example, mother's monitoring and father's monitoring (r= .70, p< .001), mother's support and father's support (r = .60, p< .001) etc. School variables entered at the fourth step explained R^2=14.2% of the variance in cigarette use. Significant predictors were school achievement (β= -.14), educational aspirations (β= -.11) and truancy (β= .33, the strongest predictor). Truancy represents a risk factor, while school achievement and educational aspirations represent protective factors for cigarette use. Peer variables are important and explain additional R^2=10.6% of the variance of the criterion. Significant predictors and risk factors were peer cigarette use (β= .33) and peer marijuana use (β= .12). It seems that the use of other drugs by peers represents a suppressor variable because of the significant regression coefficient (β= -.18) and insignificant correlation between this variable and cigarette use during the last 30 days (r= .06, p> .05). When considering all of the variables together at the final step, following significant predictors remained: gender (β= .13, p< .001), number of household cigarette users (β= .11, p< .01), truancy (β= .23, p< .001), peer cigarette use (β= .33, p< .001) and peer marijuana use (β= .12, p< .001).

Hierarchical regression analysis for alcohol consumption (composite score) produced a statistically significant coefficient of multiple correlation, $F(29, 552) = 22.81$, p< .001, and accounted for 54.5% of the variability in alcohol use. As shown in Table 1, all entered sets of variables independently accounted for a significant increment in R^2 for alcohol use. Firstly entered set of five socio-demographic variables explained R^2=16.9% of the variance in alcohol consumption. Significant predictors were three variables: gender (β= -.32), age (β= .15) and mother's level of education (β= .16). These results suggest that male subjects, older subjects and subjects whose mothers have higher level of education are more likely to use alcohol more frequently. Correlations between mother's level of education and father's level of education (r= .56, p< .001) suggest their collinear relationship, which can be the cause of mother's level of education being the only significant predictor. The set of six individual variables explained R^2=6.5% of the variance. Significant predictors were the ability to manage and control emotions (β= -.22) and religious beliefs (β= -.16), representing protective factors for alcohol consumption. The fact that some individual variables are significant predictors and some are not, can be due to the fact that they explain the same part of variance of the criteria. For example, variables religious beliefs, ritual religiosity and importance of faith (correlations from r= .71 to r = .74, p< .001), and ability to manage and control emotions, ability to perceive and understand emotion and ability

to express and label emotion (correlations from r= .54 to r = .60, p< .001) were highly correlated. Variables relating to the ability to perceive and understand emotion had a significant positive regression coefficient (β= .11), but a significant negative correlation (r= -.08, p< .05) between this variable and composite measure of alcohol consumption was also found. The set of ten family variables accounted for additional R^2=12.3% of the criterion variance. Significant predictors were father's monitoring (β= -.16), mother's support (β= .14), father's support (β= -.15) and number of household alcohol users (β= .23). Father's monitoring and father's support were protective factors, while the number of household alcohol users was a risk factor for alcohol consumption. Positive regression coefficient for mother's support as predictor of alcohol consumption was unexpected and was not in line with negative correlation between these variables (r= -.17, p < .001). The set of four school variables explained R^2=3.2% of the variance in alcohol consumption. Truancy was the only significant predictor (β= .20) and had a risk role. The set of four peer variables accounted for additional R^2=15.6% of the variance in the dependent variable although they were entered at the final (fifth) step of regression analysis. Peer alcohol use (β= .44), peer marijuana use (β= .13) and other peer drug use (β= -.07) were significant predictors. Peer alcohol use and peer marijuana use were risk factors. The role of other peer drug use is unclear (negative regression coefficient toward positive correlation) and should be further examined. Besides the possible influence of some reduction of sample size in regression analysis, complex intercorrelations could be another possible cause of these unusual results. After considering all variables together at the final step of analysis the following significant predictors remained: gender (β= -.14, p< .001), religious beliefs (β= -.10, p< .05), number of household alcohol users (β= .12, p< .001), mother's support (β= .11, p< .05), father's support (β= -.13, p< .05), truancy (β= .10, p< .01), peer alcohol use (β= .44, p< .001), peer marijuana use (β= .13, p< .001) and other peer drug use (β= -.07, p< .05).

Hierarchical regression analysis for illegal drug use produced statistically significant coefficient of multiple correlation, $F(29,555)$ =16.08, p< .001, and accounted for 45.7% of the variability in illicit drug use (composite measure). Each set of predictor variables accounted for a significant increment in R^2 for illegal drug use (see Table 1). Socio-demographic variables explained R^2=6.1% of criterion variance, with age (β= .14), mother's level of education (β= .14) and gender (β= -.09) as significant predictors. These variables were, in this case, risk factors, meaning that participant is at the greater risk to use illegal drugs more frequently if he/she had more educated mother, if he/she was older and if participant was male. Only importance of faith, out of the set of six individual variables, (β= -.18) had a predictor status. The importance of faith represented a protective factor. Adolescents for whom faith had greater importance in their lives were exposed to less risk of using drugs. Already

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Table 2
Pearson's correlation coefficients of predictive factors with the use of cigarettes, alcohol and drug among Mostar adolescents

Variable	Cigarette use	Alcohol use	Drug use
1. gender	.034	-.322***	-.103**
2. age	.142***	.144***	.144***
3. family structure	-.008	-.047	.064
4. father's level of education	.001	.206***	.147***
5. mother's level of education	-.005	.217***	.168***
6. manage and regulate emotion	-.084*	-.216***	-.110**
7. perceive and understand emotion	.037	-.080*	-.030
8. express and label emotion	.007	-.119***	-.076*
9. religious beliefs	-.086*	-.252***	-.257***
10. ritual religiosity	-.118***	-.195***	-.253***
11. importance of faith	-.089*	-.214***	-.286***
12. number of household cigarette users	.237***	.103**	.098**
13. number of household alcohol users	.141***	.290***	.094*
14. number of household drug users	.033	.119**	.185***
15. father's alcoholism	.119**	.073	.107**
16. mother's monitoring	-.225***	-.356***	-.318***
17. mother's support	-.107**	-.174***	-.144***
18. decision-making with mother	-.057	-.146***	-.118**
19. father's monitoring	-.252***	-.344***	-.294***
20. father's support	-.144***	-.222***	-.184***
21. decision-making with father	-.087*	-.163***	-.125***
22. school achievement	-.198***	-.034	-.013
23. academic failure	.194***	.061	.064
24. truancy	.439***	.358***	.233***
25. educational aspirations	.169***	.033	.066
26. peer cigarette use	.503***	.340***	.250***
27. peer alcohol use	.301***	.656***	.301***
28. peer marijuana use	.295***	.419***	.579***
29. peer other drug use	.057	.231***	.555***

mentioned high intercorrelations between the predictor variables religious beliefs, ritual religiosity and importance of faith and the possibility of them explaining the same part of variance of criteria could result in the importance of faith as the only significant predictor of drug (non)use. This set of variables managed to explain additional R^2=6% of criterion variance. The set of ten family variables explained additional R^2=12% of criterion variance. Number of household drug users (β= .16), father's alcoholism (β= .09), mother's monitoring (β= -.19) and number of household cigarette users (β= .08) were significant predictors. The number of household drug users, number of household cigarette users and father alcoholism were risk factors. Adolescents are

at the greater risk to use drugs if they have larger number of household drug or cigarette users and if their father is alcoholic. Mother's monitoring was, on the other hand, a protective factor, so that adolescents whose mothers monitor their activities more were at the less risk of using drugs. The block of four school variables, although entered at the fourth step, accounted for R^2=2.1% of the variance in illegal drug use. Truancy (β= .13) was the only predictor and represented a risk factor for drug use. Adolescents who were frequently absent from the school without relevant reason, had a greater risk to use drugs. The set of four peer variables, although entered at the fifth step, explained the largest part of variance in illegal drug use, i.e. R^2=19.5%. Peer mari-

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juana use (β= .37) and other peer drug use (β= .23) were predictor variables. These variables represented risk factors for the drug use. Therefore adolescents with higher number of marijuana and/or other drug using peers can be expected to use drugs more frequently. At the final step of analysis, when all entered predictor variables were considered, statistically significant predictors were: importance of faith (β= -.11, *p*< .05), number of household drug users (β= .13, *p*< .001), peer marijuana use (β= .37, *p*< .001) and other peer drug use (β= .23, *p*< .001).

According to the results of the hierarchical regression analysis, despite certain particularities, certain similarities between the determined predictors of the use of various psychoactive substances could be noticed. Similarities between determined predictors are greater between cigarette and alcohol use predictors (as legal psychoactive substances), than between predictors of legal and illegal psychoactive substances use. Among socio-demographic variables, age was a significant predictor in each of the regression analysis, while gender and mother's level of education were significant predictors of alcohol use and drug use. Among individual variables, common predictor for cigarette and alcohol use was the ability to manage and regulate emotion, as a component of emotional competence. Among family variables, significant predictors for each of the three psychoactive substances use were the number of household users of certain substance and parent's monitoring. It is interesting that father's monitoring was a predictor for legal psychoactive substance use, while mother's monitoring was a predictor for illegal drug use. Among school variables, truancy was determined as a significant predictor for all of the measured psychoactive substances, i.e. cigarette, alcohol and drug use. At each regression analysis, significant predictor for psychoactive substance use was the peer use of the same psychoactive substance. Peer marijuana use represented a peer variable that was a common predictor for various psychoactive substances use.

Among individual, family and school variables there are some particularities related to the determined predictors of various psychoactive substance use. Among individual variables, importance of faith was a significant predictor for the drug use only. The importance of faith, which represents defining the place of faith at the list of life priorities in adolescent life, could indicate how meaningful and purposeful adolescent considers his/her life. Religious beliefs as one dimension of religiosity were significant predictor only for the alcohol use. Among family variables, mother's support and father's support were predictors only for the alcohol use. It appears that the aspects of parenting style have particular importance for adolescent behavior towards alcohol, or that authoritative parenting style influences less alcohol use among adolescents. Father's alcoholism was a predictor for drug use only. Father's alcoholism often suggests serious family dysfunction, so it is predictive for serious risk behaviors such as drug use. The different ability of school

variables to gain predictor status, with regard to various measures of psychoactive substance use, can be perceived. Educational aspirations and school achievement were predictors for the cigarette use only.

DISCUSSION

Predictor variables explained the variance of alcohol use to a large extent, i.e. 54.5%, as well as 45.7% of the variance in drug use and 42% of the variance in cigarette use. Also, based on predictor variables considered, alcohol use could be better predicted than drug or cigarette use. The obtained standardized regression coefficients suggest truancy and peer cigarette use as best predictors of cigarette use. Although peer variables were entered at the final step of hierarchical regression analysis, peer alcohol use can best predict to which degree adolescent consume alcohol. Similar as for alcohol use, best predictors for the drug use were peer variables, i.e. peer marijuana use.

Correlations between the uses of various types of psychoactive substances were statistically significant even when the influence of socio-demographic variables was partialized. Obtained correlations can be observed in the quantitative aspects of use, as well. Namely, adolescents smoking more cigarettes also use more alcohol and drugs, or those consuming more alcohol also consume drugs more.

Inclination towards psychoactive substances abuse and inclination to socially deviant behavior are derived partially from the same source. It is possible that the source of common variability is within variables considered, which means that correlations are the result of the interaction between variables. On the other hand, there is a possibility that inclination towards substance abuse is a product of one common external factor, which means that there is no interaction between variables and that intercorrelations are secondary. These possibilities do not exclude one another, and causality can be two-way which complicates the situation. However, general inclination for psychoactive substances abuse can be considered. There is a common variance of related manifest variables, while the other part of manifest variability depends on specific factors, i. e. specific inclinations. General inclination defines the essence of psychoactive substance use, and specific inclinations are responsible for differences and particularities of various psychoactive substance use behavior.

According to the results of hierarchical regression analyses and the comparison of obtained predictors of cigarette, alcohol and drug use, common predictors can be stated. The common predictors for all three types of psychoactive substance use are: truancy and peer marijuana use. The predictors that can be considered similar because they have the same basis, but apply to a specific psychoactive substance, are: number of household users (cigarettes or alcohol or drug) and peer psychoactive substance use (cigarettes or

alcohol or drug). The recent research conducted on a representative sample of the Croatian high school students also confirmed that tobacco, alcohol and marijuana use had a very similar structure of predictors (Ljubotina, Galić, & Jukić, 2004).

Since these are related phenomena, it is unreasonable to make partial preventive programs or programs aimed to prevent the use of only one (or some) psychoactive substance. Problem of preventive programs aimed at specific inclinations is that, even if successful, they do not affect the general substance abuse inclination (or not sufficiently) and can cause the shift to other specific inclination. One inclination towards substance use can be compensated with another (e.g. alcohol can compensate drugs, sedatives can compensate alcohol etc.). Therefore, it is justified to create preventive programs which would at the same time aim at the prevention of use of all three psychoactive substances and affect the general substance use inclination.

However, specific inclinations should not be neglected, and specific subprograms should be focused on these. The research results indicate that specific predictors for use of certain psychoactive substances, as well as certain sets of factors, do not have the same predictive importance for the use of various types of psychoactive substances. Some factors are predictors only for the use of legal substances, but not for the use of illegal psychoactive substances. Such factors are derived from the set of individual variables, i.e. the ability to manage and regulate emotion as a component of emotional competence. It seems that the ability to manage and regulate emotion influences the decision about the use of legal psychoactive substances, and when threshold of the use is reached, further decision to use illegal psychoactive substances is more influenced by some other factors. Similarly, father's monitoring was a predictor for cigarette and alcohol use, while mother's monitoring was a predictor for drug use. However, at least one aspect of authoritative parenting style is important as a predictor of use of any kind of psychoactive substance. The greatest number of factors representing the parenting style gained a predictor status for alcohol use.

Importance of faith and father's alcoholism were predictors only for drug use. The direction of causal relation when considering the importance of faith is not clear and two-way causality is possible (i.e. adolescents to whom faith has no importance in their lives have a tendency to use drugs and/or those who use drugs can start to experience faith as less important in their lives). Regardless of the causal direction, it is clear that adolescents who give little importance to faith in their lives should be considered a risk group for drug use. However, actions aimed at individuals who have not yet started to consume psychoactive substances and to whom faith could gain higher importance in their lives, could have a protective role. Considering father's alcoholism, the direction of influence is clearer and adolescents whose father is alcoholic represent a risk group for drug use.

The dimension of religious beliefs was a significant predictor for alcohol use only. Some researches (Pargament, 1997; Wills & Hirky, 1996; as cited in Wills et al., 2003) suggest that religiosity may influence the way people tend to cope with problems and their perception about the coping functions of substance use. As the importance of faith represented a significant predictor for illegal drug use and religious beliefs represented a significant predictor for alcohol use, it seemed that they measured somewhat different concepts. Therefore, in future research it would be useful to examine and clarify possible differences between these measures.

Confirmed risk and protective factors are potentially the most efficient targets for preventive actions in Mostar region, considering all types of psychoactive substances (excluding socio-demographic variables which are difficult or impossible to influence). Risk factors confirmed as predictors are: number of household psychoactive substance users (tobacco, alcohol, drugs), father's alcoholism, truancy and peer psychoactive substance use (tobacco, alcohol, drugs). However, the role of the onset of substance use should also not be neglected (although not used in regression analyses) since it probably represents the risk factor that should be acted on (obtained moderate correlations). On the other hand, protective factors confirmed as predictors of psychoactive substance use are: the ability to manage and regulate emotions (a component of emotional competence), religiosity (more specifically, religious beliefs), the importance of faith and components of authoritative parenting style (particularly parental monitoring, as well as parental support).

Excluding the contribution of socio-demographic variables in explaining variance of dependent variable, a set of school variables can best explain cigarette use followed by a set of family variables and a set of peer variables; a set of peer variables can best explain alcohol use followed by a set of family variables; and a set of peer variables can best explain drug use followed by a set of family variables. In accordance with our expectations, in all of the three cases peer variables were among the leading and had the highest standardized regression coefficients (β). This finding suggests a great importance of peers on adolescent attitudes towards psychoactive substances. These results are in accordance with the results of other research (Gerstein & Green, 1993, Kumpfer et al., 1998; according to National Institute on Drug Abuse and National Institutes of Health [NIDA & NIH], 2003) showing that family risk factors have more influence on younger children, while relationships with peers consuming psychoactive substances can be more significant risk factor for in adolescence.

Considering these findings and the fact that adolescent decides to try and continues the use of psychoactive substances in order to conform, i.e. in order to be accepted in peer group, we can not overstate the importance of including the theme "how to resist peer pressure" in work with adolescents within primary preventive programs of substance

abuse. If we accept that adolescent who has already been a consumer will chose peers with similar attitudes and behaviors, it remains clear that a problematic group reinforces problem behavior and encourages problems with psychoactive substances. This means that it is very important to include parents as target group in prevention programs, where they would be informed about the possible ways of peer influence on their children and they would be shown the ways of good and adequate protection.

Aspects of parenting style also gain importance in prevention. It is desirable to educate parents about practicing authoritative parenting style. This research also confirms parent's monitoring as a protective factor for psychoactive substance use. Generally accepted point of view is that parent's monitoring and supervision represent crucial targets for prevention of psychoactive substance use (NIDA & NIH, 2003). These skills could be improved by training on rulemaking, techniques for monitoring activities, rewarding appropriate behavior and moderate, consistent discipline, which reinforces defined family rules (Kosterman et al., 2001; as cited in NIDA & NIH, 2003).

When comparing results of regression analyses it can be noticed that sets of family variables succeed to explain a considerable part of variance of all psychoactive substances, which confirms that family as well as the peers keep important role in adolescence period. Excluding the contribution of peer variables, when comparing the contributions of sets of variables to explaining criterions, it can be noticed that for drug and alcohol use as criterion variables, family variables have a more prominent role than other blocks. This finding confirms that more serious types of risk behavior are more associated with family functioning (Raboteg-Šarić, Sakoman, & Brajša-Žganec, 2002).

As cited in Mothersead, Kivlighan, and Wynkoop (1998) some studies (Wright & Heppner, 1991, 1993) done on non-clinical samples failed to find differences in psychological and interpersonal problems between the group of individuals who did and the group of individuals who did not report growing up in family where alcohol was abused. On the other hand, studies (Hinz, 1990) done with clinical samples found differences between these two groups. Although, this research was done with a nonclinical sample, father's alcoholism was confirmed as a predictor for illegal drug use. Sher and Descutner (1986; as cited in Mothersead et al., 1998) stated that parental alcoholism could be reliably assessed by the use of self-report methods, but they also stated that false negatives were more likely to occur when these methods were used. This could be one of the reasons that father's alcoholism was a weak predictor for illegal drug use ($p< .05$). The reason for father's alcoholism being a predictor only for the drug use can be explained by the fact that more serious family dysfunction, which often exists in families with an alcoholic father, makes its impact on more risky behavior towards psychoactive substances. As it is often not possible to influence father's alcoholism directly, it may be possible to moderate the effects of family history of alcoholism by intervening with children who are at risk because of their exposure to this environment (Hawkins et al., 1992). Some authors suggest that preventive actions should aim at changing the learned dysfunctional attachment through counseling, because they consider attachment as a mediator of functioning of relationships with other people (Mothersead et al., 1998). Adolescents whose parent is an alcoholic could be seen as individuals who have at least one risk factor in their lives. However, considering the model of multiple risk and protective factors where inclination to use psychoactive substances depends on a complex relation between risk and protective factors, there is possibility to make preventive influence by establishing new and strengthening the already existing protective factors in their lives. In this case school, i.e. teaching staff, can play an important role by recognizing such adolescents, providing them with special counseling support, strengthening commitment to school as alternative secure environment etc.

As the number of consumers of certain psychoactive substance in the family represents the predictor for different patterns of use, it is obvious that not only parents, but also siblings, serve as models. If there are more "bad" models, or family members who consume particular psychoactive substance, adolescent is more likely to consume that psychoactive substance and to consume it to a greater extent. Hawkins, Catalano, & Miller, (1992) stated several researches (Ahmed, Bush, Davidson, & Iannotti, 1984; Hansen, Graham, Sobel, Shelton, Flay & Johnson, 1987; Brook, Brook, Gordon, Whiteman, & Cohen, 1990) that showed effects of parental modeling of substance use on their children's substance use. Therefore, it is desirable to build a healthy relation towards psychoactive substances and to do that by own example of abstinence. Within the preventive programs parents should be warned that not only does the excessive consumption give bad example to their children, but this is also the case for their decision for or against use, as well as for the number of users in the family. It is also important to educate and inform parents about psychoactive substances, which can reinforce what the children learn about harmful effects of psychoactive substances, and in turn open opportunities for family discussion about the use of legal and illegal substances (Bauman et al., 2001; as cited in NIDA & NIH, 2003). Evaluations of different preventive programs show that family focused preventive actions have a greater impact than strategies focused on parents or children only (NIDA & NIH, 1997). Therefore, it is reasonable and desirable to implement these recommendations within family-focused preventive program which would be created for Mostar region.

As the results of this research show the influence of early onset of use, it seems that the right time for prevention is in early adolescence. The estimate of the right time for preventive actions determines their effectiveness to a great extent. The effectiveness is much better when the inclination to use

psychoactive substances has not been demonstrated yet. While the adolescent is still in the stage of abstinence a particular psychoactive substance has not gained psychological value to him/her and has not represented personal problem, so he/she is more receptive for rational influence. However, evaluations of programs which provide only knowledge to adolescents, the facts about psychoactive substances and consequences of its use, demonstrate that this type of preventive programs have little or no influence on the likelihood of psychoactive substances use.

The use of psychoactive substances is significantly represented among high school population so preventive actions should be aimed at pupils in elementary school. Some research show that preventive programs aimed at general population in the period of important transitions can create positive effects even for high risk families and children (Botvin et al., 1995, Dishion et al., 2002; as cited in NIDA & NIH, 2003). Preventive programs could be aimed at adolescents, pupils in seventh and eighth grade of elementary school, expecting an often stressful transition to high school. However, even earlier interventions could be useful because they could, almost for all individuals, have a higher effectual potential at start, as tobacco and alcohol use are still not present. The first contact with psychoactive substances usually represents the use initiation, and often further consummation of tobacco and/or alcohol. This research confirms the obvious - that prevention targets should be tobacco and alcohol.

Results from this research confirmed the importance of a number of risk and protective factors from groups of individual, family, school and peer variables, as predictors of psychoactive substance use for adolescents from Mostar, established also in previous research. As it is known that preventive programs should be adapted to the local community, the results give directives about which risk factors should be worked on to decrease or completely remove their influence and which protective factors should be promoted, i.e. reinforced. Confirming the importance of factors from different domains in this research also, serves as another clarification and confirmation of the fact that the efficiency of preventive actions is increasing when these activities are aimed at more than one domain (i.e., individuals, peer group, family, school, community). There is an opinion that preventive programs aimed at community which combine two or more efficient programs, as family programs and school programs, could be much more efficient than a single program (Battistich et al., 1997; as cited in NIDA & NIH, 2003). The research results are in line with this, because they confirm the importance of individual, family, school and peer variables. Additionally, considering the statements from the model of multiple risk and protective factors for psychoactive substance use, it is logical that including a larger number of relevant factors would considerably promote the efficiency of preventive programs. These findings and conclusions could serve as directives for creating substance use preventive program for the Mostar region.

Finally, this research has its limitations. As it is a simple cross-sectional study, we can not conclude on the causal relationship but can only hypothesize one. Longitudinal studies would provide more valid conclusions. Experimental research is needed to discover which risk and protective factors are causal and which are spurious in the etiology of substance use and abuse (Hawkins et al., 1992). When gathering sensitive data (as it is substance use) self-report measures can be influenced by socially desirable answers. In this research there was an attempt to minimize this influence as participants answered questionnaires alone, guarantees of anonymity and confidentiality were given and during the answering only the researcher was present in the classroom. However, the use of self-report measures increases the likelihood that the use of the same method could produce artificial increase of correlations between variables considered (Voelkl & Frone, 2000). School surveys miss the children not present in school (Johnston, 1989). This research was conducted in a school setting and, therefore, it has several important limitations including under representation of truants and school dropouts and a limited access to adolescents considered at particularly high risk for substance abuse (Newcomb, 1995). Therefore, the most serious drug users (particularly addicted users) were probably excluded due to these reasons or some of them provided invalid questionnaires. These possibilities may account for the restricted range of scores especially on substance use measures resulting in the reduced variability in the data. This reduced variability would, however, act to attenuate the relationship found in the hierarchical regression analyses. Additional direction for future researches would be to test interactions as the last step in the regression equation.

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