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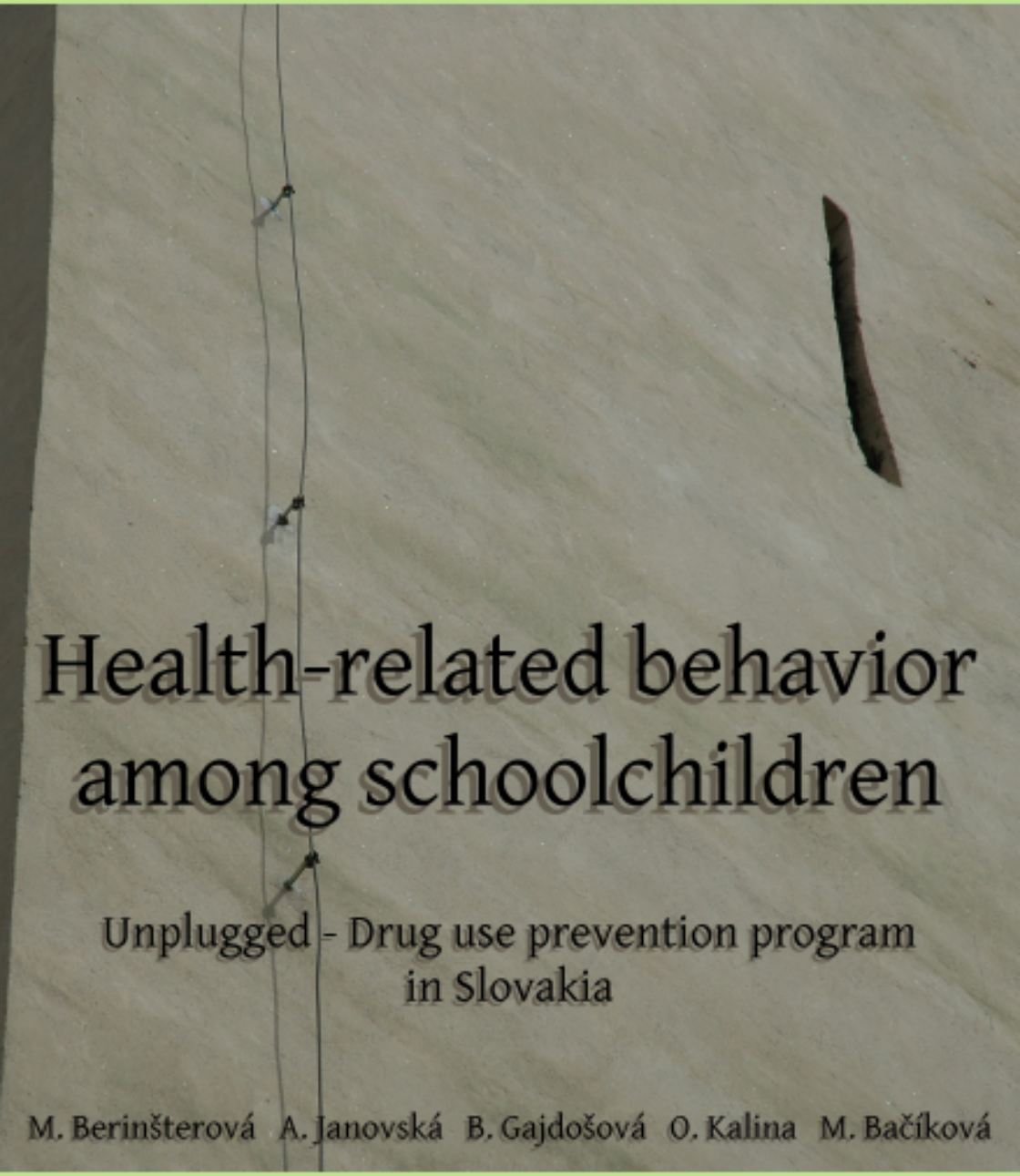

Health-related behavior among schoolchildren

Unplugged - Drug use prevention program in Slovakia

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Contents

Preface

Adolescence is the life period of the onset of behavior that may be identified as being risky in terms of possible negative consequences for health. It is also the period if intensive psychosocial development. The term health related behavior represents a range of various behaviors which include substance use and risky sexual behavior. Many risk factors are associated with health related behavior and can be categorized into personality factors, factors related to close people (e.g. family, friends, classmates) and also factors related to a broader social and cultural context. Research findings regarding risk and protective factors of health related behavior represent an important source for prevention strategies and prevention program implementation.

Within the project APVV 0253-11 the evaluation of effectiveness of the drug use prevention program Unplugged has been conducted.

The Unplugged is an universal school-based prevention program aimed at substance use prevention among early adolescents. This program was developed and evaluated as a part of the EU-DAP project (European Drug abuse prevention) in 8 European countries (Austria, Belgium, Germany, Greece, Italy, Spain, Sweden and the Czech Republic). It is based on a comprehensive social influence model which promotes positive and healthy behavior and strives to prevent the use of addictive substances (smoking, alcohol use and other addictive substances).

The Unplugged program consists of 12 lessons which focus on 3 thematic areas: information and attitudes (information about positive and negative effects of drug use, changing misguided beliefs about substance use), interpersonal skills (recognition and appreciation of positive qualities, acceptance of positive feedback, training and reflecting on forming relationships, fostering assertiveness and respect for others, adequate communication of emotions, distinguishing between verbal and nonverbal communication, clarification of group influences and group expectations) and intrapersonal skills (distinguishing long term and short term goals, structured problem solving, expression of negative feelings, coping with weaknesses, fostering critical evaluation of information, reflection on differences between one's opinion and actual data, understanding norms and how they affect behavior).

The lessons of the Unplugged program were led by trained teachers. In the first phase of the program a specific training was provided. This training was aimed at learning about the program, the testing and teaching individual lessons. In the school year 2013/214 Unplugged was implemented in Slovakia for the first

time. It was implemented at 32 schools in 12 consecutive weeks as part of the school curriculum. The list of schools, where program implementation took place, is provided at the end of the publication.

Within the program, a baseline and 4 follow-up data collections were conducted in 63 primary schools in Slovakia. The schools were divided into experimental and control schools. A large part of the analyses come from the data from the first 3 data collections and are presented in this part of the monograph. Data analyses from the next two follow-ups are in the process.

This monograph consists of five chapters. The first two chapters are dedicated to the exploration of associations between health-related behavior and intrapersonal factors (self-control, self-liking, self-efficacy, self-system, resilience). The next two chapters focus on selected family factors (parental monitoring and parental risk behavior) in relation to the health-related behavior of children. The last chapter concerns the evaluation of the effectiveness of school universal prevention program Unplugged.

In the first chapter, we focused not only on health-related behavior but also on other selected types of problem behavior (excessive computer gaming, fighting at school, damaging school property, steeling, troubles with police, running away from home, destructive thoughts/behavior). The aim was to describe the prevalence of these behaviors among the Slovak early adolescents. Associations between personal factors (self-control, self-liking, resilience), parental monitoring and in the case of alcohol, expectations of alcohol use and problem behavior were examined.

In the second chapter, the main aim was to explore the relationship between the aspects of self- system (the self-concept clarity, the dimensions of self-esteem: self-liking, self-competence, negative and positive self-esteem, aspects of self-efficacy: general and social, refusal of cigarettes, refusal of alcohol) and health-related behavior (alcohol use and smoking cigarettes) among early adolescents.

The third chapter explored the associations between parental processes and the three types of health-related behavior among adolescents. There is an ongoing discussion in the research which provides new and alternative concepts of parental processes compared to previous concepts. A typical example of this is how parental monitoring process are actually interpreted. The new concepts understand monitoring as mutual process of both parents and children which is based on spontaneous sharing information by children. Relationships within family processes were mostly studied in the context of delinquent behavior of adolescents and young adults. Therefore, there is a lack of studies which would focus on other types of risky behavior such as alcohol use, smoking or sexual risk behavior.

An association between parental health-related behavior (smoking, weekly alcohol consumption and drunkenness) and specific health-related behaviors of

their children are addressed in the fourth chapter of this monograph. Previous research suggests the possibility that this association is not necessarily direct but can be also mediated via other variables. Therefore, the possible indirect (mediated) effect will be tested in this chapter. Several mediators considered within the study will include perceived parental approval of substance use and estimated number of using friends for smoking. With regard to drinking several parenting characteristics will be included in the analyses: parental rules setting, parental knowledge of adolescent's whereabouts and parental support.

Evaluation of effectiveness of prevention programs is rare in Slovakia. The Unplugged is a school-based universal prevention program, based on three effective prevention strategies, information giving approach, life-skills enhancement and social influence approach. In the school year 2013/2014 the Unplugged was implemented in representative sample of Slovak schools for the first time. The last chapter of this monograph will with the short-term effectiveness of the program Unplugged.

Individual and family correlates of problem behavior in early adolescence

Introduction

Adolescence is the period in which risky or problem behaviors such as alcohol consumption, smoking and other forms of substance abuse, self-harm, various forms of unsafe behaviors, delinquency, and running away from home are initiated and may escalate. Many of the adversities and difficulties during adolescence are associated with significant changes in the psychological and social development of young girls and boys (Oshio et al., 2003). The problem behavior of juveniles often leads to substance use, criminality, and police arrests in adulthood (Dishion & Patterson, 2006; Véronneau & Dishion, 2010).

Adolescent problem behavior is a heterogeneous category consisting of various types of behavior such as delinquency, aggression, substance abuse, sexual risky behavior, eating disorders and self-destructive activities including suicide attempts (Durkin, 1995 in Macek, 2003). The most common types of problem behavior of Slovak adolescents from the perspective of the teachers are distraction in class, low respect towards teachers, using vulgar expressions, lying and cheating. But the teachers also perceive aggressive behavior, damaging school property, stealing and alcohol use as disturbing forms of behavior in Slovak schools (Zemančíková, 2014). Tobacco and alcohol are the drugs of choice among the youth. Many young people are experiencing the consequences of drinking and are drinking at an early age. There are many factors which could potentially be associated with alcohol drinking of juveniles.

Early adolescence also represents the time when youth are at an increased risk of involvement in aggressive behavior. It usually escalates during this developmental period.

Nowadays there are modern types of dependency. One of them is problematic internet use and risky or excessive gaming constitutes a part of it. This kind of problem behavior is common among adolescents (Dongping et al., 2013).

Various problems in adolescence often lead to desires to escape from reality and tend to promote self-destructive behavior or opposition towards a perceived unsatisfactory family

environment. Running away from home, self-harming behavior and suicide attempts during adolescence are high risk behaviors for safety and health and these forms of problem behavior have severe consequences (Kokkevi et al., 2014). Approximately 20 % of European schooled adolescents report self-destructive thoughts and/or behaviors (Cheng et al., 2009; Prinstein, 2008; Toro et al., 2009 in Cruz et al. 2013). Suicide is one of the leading causes of death among young people (WHO, 2006).

Factors associated to problem behavior in adolescence

Self-regulation is one of the potential predictors of risky behavior of children and adolescents (Orosová et al., 2007). Higher levels of ability to manage emotions could be associated with controlling behavior including risky behavior as well as alcohol use (Carlos & Sharma, 2012). Self-liking and self-control are the next relevant factors linked to problem behavior of early adolescents. A low level of self-control would be associated with behavioral problems (aggression, delinquency) while overcontrol could be linked to emotional problems such as depression and low self-esteem (Finkenauer, Engels, & Baumeister, 2005). Some studies reported a negative correlation between problem behavior (delinquency, aggression and other kinds of antisocial behavior) and satisfaction with oneself (Donnellan et al., 2005).

One of the factors that plays an important role in understanding the adjustment process of individuals is resilience (Nakaya, Oshio, & Kaneko, 2006). Resilience is generally defined as an individual's ability to evolve in the intentions of normal, healthy development despite the presence of prolonged stress or negative or risky circumstances (Fribourg, Hjemdal, & Martinussen, 2009). Resilience could also be viewed as an interaction between risk factors (vulnerability) and protective resources (Rew& Horner, 2003).

A number of studies have supported the assumption that parental support, strict control and monitoring children's activities and friends are related to problem behavior. Parental interest reduces behavioral and emotional problems of young people (Finkenauer, Engels, & Baumeister, 2005). A lack of parental monitoring significantly predicts adolescents' alcohol misuse, use of other substances and delinquent behavior (Barnes et al., 2006). The relationship between alcohol consumption and parental monitoring has been supported by several studies (Kelly et al.,

2012). Parental control includes parental behaviors toward the child with the intention of directing the child's behavior ina manner acceptable by the parent (Barnes et al., 2006). Wills, Mariani, and Filer (1996 in Barnes et al., 2006, p. 1085) stated that "support from parents is the glue that bonds adolescents to mainstream institutions and builds self-control." Wang et al. (2015) found that parental practices and parental monitoring influences building social competence of young people regarding friendship formation. Successful parental monitoring leads to fewer opportunities for adolescents to associate with friends with problematic behavior (Dishion et al., 1995; Nash, McQueen, & Bray, 2005). Parental monitoring is also negatively associated with tobacco smoking initiation (Simons – Morton, 2002).

The lack of adequate parenting and monitoring are some of the risk factors related to aggressiveness and juvenile delinquency too (Patterson & Stouthamer-Loeber, 1984 in Batool, 2013). Many empirical studies have confirmed the major role of parenting in developing aggressive behavior (Georgiou, 2008). Aggressive children exhibit rigid parent-child interactions and these rigid repertoires may provide the context through which children fail to acquire emotion-regulation skills (Granic et al., 2012).

Some of the other relevant predictors of aggression among children are demographic variables. At all ages, males are more likely than females to commit major acts of violence and to be arrested (US Department of Justice, 1995). Gender differences in physical aggression are present from early childhood and remain relative stable throughout adolescence (Carlo et al., 1999).

There are many factors which contribute to excessive computer gaming, such as family/parental factors, school connectedness, peers and intrapersonal characteristics, especially self-control (Dongping et al., 2013).

Self-destructive behavior of adolescents is a complex and multifactorial phenomenon but until now there has been no empirical evidence that parental control is a relevant predictor of such behavior (Wong, Man, & Leung, 2002 in Cruz et al. 2013). On the other hand Kokkevi et al. (2014) have found that suicide attempts and running away from home had some common correlates including parental monitoring and emotional and behavioral problems. The factor, which seems to be negatively associated with the tendency to harm oneself is self-esteem (Cruz et al., 2013). There is a significant association between gender and

suicide attempts (more common among girls) and between gender and running away from home (more common among boys) (Kokkevi et al., 2014).

Aim

The aim of this study was to describe problem behavior among Slovak early adolescents and examine the associations between a selection of problem behaviors (alcohol consumption, tobacco smoking, excessive computer gaming, fighting at school, damaging school property, stealing, troubles with police, running away from home, destructive thoughts/behavior), some personal factors (self-control, self-liking, resilience), parental monitoring and in the case of alcohol consumption expectations of alcohol drinking young people had.

Sample

The research sample consisted of 1094 early adolescents (54.3% girls, Mean age=11.72; SD=0.67) from a stratified random sample consisting of pupils in 60 primary schools in Slovakia. The respondents were from the 5th to 7th grades, most often 6th grade (98 %) at primary school. The data was collected in September 2013 within a project aimed at school-based universal prevention.

Measures

Dependent variables

All dependent variables were measured using items from the ESPAD Questionnaire 2007 (http://www.espad.org/Uploads/Documents/ESPAD_Questionnaire_2007.pdf).

Alcohol consumption. All adolescents were asked to complete questions about their lifetime prevalence of alcohol consumption. Lifetime prevalence of alcohol consumption was measured by the question "On how many occasions (if any) have you had any alcoholic beverage to drink in your lifetime?" with the following available answers: 0, 1-2, 3-5, 6-9, 10-19, 20-39, 40 or more. Alcohol consumption was dichotomized and served as the dependent variable (0=never, once or two times; 1= more than two times).

All respondents were asked to complete a question concerning their lifetime experience with being drunk: "On how many occasions (if any) have you been intoxicated from drinking alcoholic beverages, for example staggered when walking, not being able to speak properly, throwing up or not remembering what happened?". They could answer on following scale: 0, 1-2, 3-5, 6-9, 10-19, 20-39, 40 or more. This item was dichotomized and served as the next dependent variable (0=never, 1=at least once).

Tobacco cigarettes smoking. The lifetime prevalence of tobacco cigarettes smoking was measured by the following question: "On how many occasions (if any) during your lifetime have you smoked cigarettes?" with the following permitted answers: 0, 1-2, 3-5, 6-9, 10-19, 20-39, 40 or more. The variable lifetime prevalence of tobacco cigarettes smoking was dichotomized (0=never; 1=at least once).

Excessive computer gaming. The adolescents were asked how often they play computer games with the following available answers: never; a few times a year; once or twice a month; at least once a week; almost every day. Respondents who said they played computer games almost every day were coded 1 and the others were coded 0.

Fighting at school. The next questions we asked concerned aggressive behavior of adolescents. They were to answer how often they had got into a fight in school during the last 12 months (0, 1-2, 3-5, 6-9, 10-19, 20-39, 40 or more). The variable was dichotomized in the following way: 0=never; 1=once or more.

Damaging school property on purpose. The next kind of problem behavior that was analyzed was damage of school property. The respondents were asked question: "During the last 12 months, how often have you damaged school property on purpose?" with the following answers: 0, 1-2, 3-5, 6-9, 10-19, 20-39, 40 or more. They were then divided into two groups: 0=never; 1=one or more.

Shoplifting. All respondents were asked to complete question concerning shoplifting. They were asked if they had ever taken something from a shop without paying for it. They had to answer how many times (if at all) they had stolen something (0, 1-2, 3-5, 6-9, 10-19, 20-39, 40). The item was dichotomized: 0=never; 1=one or more times.

Getting into trouble with the police. The next questions concerned whether the adolescents had ever got into trouble with the police for something they did, and the possible answers were: 0, 1-2, 3-5, 6-9, 10-19, 20-39, 40. The item was dichotomized: 0=never; 1=one or more times.

Running away from home. Furthermore the study was interested in the frequency of running away from home among early adolescents. The question was asked: "Have any of the following ever happened to you?" with just one option - run away from home for more than one day. Possible answers were: not at all;

once; twice; 3–4 times; 5 or more times. The variable was dichotomized: 0=not at all; 1=one or more times.

Self-destructive thoughts/behavior. Firstly, the respondents were asked if they had ever had any thoughts of harming themselves. The next question concerned attempted suicide. The possible answers to both questions were: not at all; once; twice; 3–4 times; 5 or more times. Both variables were dichotomized: 0=not at all; 1=one or more times.

Independent variables

Alcohol drinking expectations. The items used for measuring alcohol drinking expectations also came from the ESPAD Questionnaire 2007. The respondents answered questions: "How likely is it that each of the following things would happen to you personally, if you drank alcohol?" Positive drinking expectations were measured by a summary score of the following possibilities: feel relaxed, feel happy, feel more friendly and outgoing, have a lot of fun. The Cronbach alpha for positive expectations was 0.812.

Negative drinking expectations were measured by a summary score of these possibilities: get into trouble with the police, harm my health, not being able to stop drinking, having a hangover, doing something I would regret, feeling sick. The Cronbach alpha for negative expectations was 0.817. The items were chosen using factor analysis. Higher levels indicate a higher level of expectation.

Parental monitoring. Questions about parental monitoring (Hibell, 2012) consisted of questions concerning rules at home as well as information where and who their children spend their free time with (the available answers ranged from 1=never to 4=almost always). The scale of parental monitoring consisted of 4 items (my parent(s) set definite rules about what I can do at home; my parent(s) set definite rules about what I can do outside the home; my parent(s) know who I am with in the evenings; my parent(s) know where I am in the evenings). A higher score indicates a higher level of parental monitoring. The Cronbach alpha was 0.694.

The *Self-Control* Scale (Finkenauser, Engels, & Baumeister, 2005) consisted of 11 items and respondents could answer on a five-point scale (1=never, 5=always). A higher score indicated a higher level of self-control. The Cronbach alpha was 0.709.

Self-liking. As a measure of positive self-affiliation the subscale Self liking of the questionnaire SLCS-R - Self-liking/self-competence scale - revised version was used (Tafarodi, Swann, 2001) which consists of 8 items and respondents can answer on a five-point scale (1=strongly agree; 5=strongly disagree). A higher score indicated a higher level of self-liking. The Cronbach alpha = 0.533.

Resilience. The Adolescent Resilience Scale consists of three subscales: Novelty seeking (7 items; Cronbach alpha=0.391), Emotional regulation (9 items; Cronbach alpha=0.496) and Positive future orientation (5 items; 0.803) (Oshio et al., 2003) and was used in this study. The respondents were asked to choose a rating scale using the anchors of 5=definitely yes and 1=definitely no. A higher score indicates a lower level of the variable.

STATISTICAL ANALYSIS

Binary logistic regression was used for the data analysis. Eleven models were created, separately for every type of problem behavior. As dependent variables (dichotomized) lifetime experiences of alcohol consumption, lifetime experiences of drunkenness, lifetime prevalence of tobacco cigarettes smoking, excessive computer gaming, fighting at school, damaging school property on purpose, shoplifting, getting into trouble with the police, running away from home, thoughts of harming oneself, suicide attempts were used.

The models consisted of six independent variables (self-control, self-liking, novelty seeking, emotional regulation, positive future orientation and parental monitoring) but in the models for alcohol consumption (lifetime prevalence of alcohol use and drunkenness) as the dependent variables, alcohol drinking expectations (positive and negative) as additional independent variables were added.

RESULTS

Alcohol consumption

Lifetime prevalence of alcohol consumption

About 40% of juveniles in the research sample had experience with alcohol use. The overall prevalence of lifetime alcohol experience was higher among boys (N=119) than among girls (N=78). Figure 1 shows the self-reported lifetime prevalence in percentages by gender.

Figure 1 Lifetime prevalence of alcohol consumption in percentages among early adolescents by gender

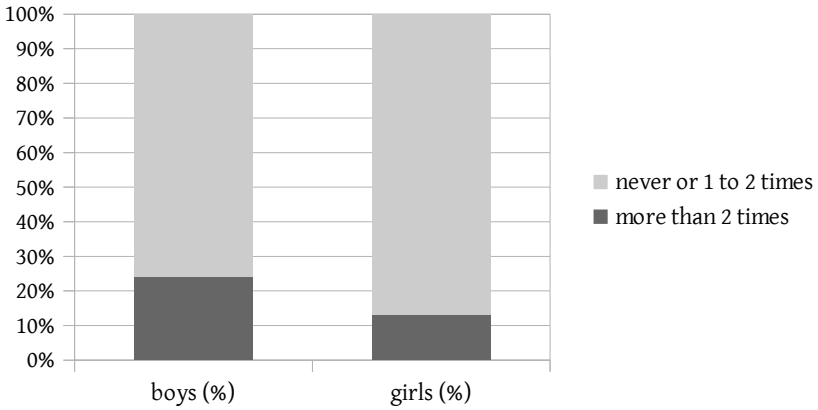


Table 1 shows the results of the logistic regression analysis with lifetime prevalence of alcohol consumption as the dependent variable. Binary logistic regression was performed to assess the impact of a number of factors on the likelihood that respondents would report that he or she had experienced alcohol drinking at least three times until now. The full model consisted of one control variable (gender) and eight independent variables (parental monitoring, positive and negative expectation of alcohol drinking, self-control, self-liking, novelty seeking, emotional regulation, positive future orientation). The full model which contained all predictors was statistically significant (=39.9, df=9, p<0.001). It explained between 7.7% and 12.6% of the variance in the occurrence of lifetime experiences of alcohol consumption and correctly classified 82.2% of the cases.

As reported in Table 1, only five of the independent variables made a statistically significant contribution to the model – gender, positive expectations of drinking, negative expectations of drinking, novelty seeking and positive future orientation. Being a boy and higher positive and lower negative expectation of alcohol drinking consequences (for example "I feel relaxed, happy" or "I will have some trouble with police"), higher novelty seeking and a lower positive future orientation, increased the likelihood that respondents would have more experience with alcohol drinking.

Table 1 Logistic regression model of lifetime experiences of alcohol consumption among early adolescents

		Cox & Snell R^2 = 0.077; Negelkerke R^2=0.126			
	B	Sig.	Exp(B)	95% C.I.	
gender[a]	-0.529	0.032	0.589	0.363	0.957
parental monitoring	-0.036	0.253	0.965	0.908	1.026
positive expectations of drinking	-0.122	<0.001	0.886	0.831	0.944
negative expectations of drinking	0.079	0.001	1.082	1.031	1.136
self-control	0.021	0.180	1.022	0.990	1.054
self-liking	-0.021	0.493	0.979	0.922	1.040
novelty seeking	-0.097	0.013	0.907	0.840	0.980
emotional regulation	0.037	0.197	1.038	0.981	1.098
positive future orientation	0.079	0.027	1.082	1.009	1.160
constant	-0.323	0.831	0.72		

Note: [a]men as the reference group

On the other hand, parental monitoring, self-control, self-liking and emotional regulation did not appear to be significant in the model. As reported in Table 1, the strongest evidence of the relationship to alcohol drinking was found for positive and negative expectations of drinking. This indicates that for respondents who believe that after alcohol drinking things will be mainly positive, the probability of alcohol consumption will increase.

Lifetime prevalence of drunkenness

The lifetime prevalence of drunkenness is almost the same among boys and girls (Figure 2). 464 boys and 561 girls of the research sample had never been drunk, but 13 schoolchildren reported that they had been drunk more than three times.

The full binary regression model containing one control variable (gender) and eight independent variables (parental monitoring, positive and negative expectation of alcohol drinking, self-control, self-liking, novelty seeking, emotional regulation, positive future orientation) allowed us to distinguish between adolescents who reported and those who did not report ever being drunk (Table 2). The full model containing all predictors was statistically significant (=29.1, df=9, p=0.017). It explained

between 8.3% and 13.6% of the variance in the occurrence of lifetime experiences of drunkenness and correctly classified 95.3% of the cases.

Figure 2 Lifetime prevalence of drunkenness in percentages among early adolescents by gender

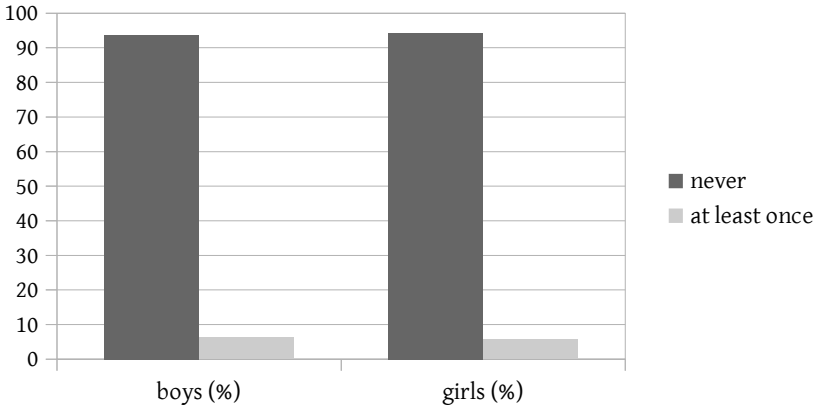


Table 2 Logistic regression model of lifetime experiences of drunkenness among early adolescent

		Cox & Snell R^2 = 0.083; Negelkerke R^2=0.136			
	B	Sig.	Exp(B)	95% C.I.	
gender[a]	-0.081	0.854	0.922	0.387	2.198
parental monitoring	-0.087	0.096	0.917	0.828	1.016
positive expectations of drinking	-0.122	0.028	0.885	0.794	0.987
negative expectations of drinking	0.001	0.980	1.001	0.911	1.100
self-control	-0.011	0.681	0.989	0.939	1.042
self-liking	-0.050	0.375	0.951	0.852	1.062
novelty seeking	-0.047	0.489	0.954	0.835	1.090
emotional regulation	0.125	0.028	1.133	1.014	1.266
positive future orientation	0.050	0.401	1.051	0.935	1.182
constant	-1.598	0.583	0.202		

Note: [a]men as the reference group

A higher level of positive expectations of drinking and a lower level of emotional regulation were associated with lifetime prevalence of drunkenness among early adolescents. The other independent variables (gender, parental monitoring, negative expectations of drinking, self-control, self-liking, positive future orientation) did not appear to be significant in the model.

Tobacco smoking

The respondents were asked to indicate whether they had had a tobacco cigarette in their lives. 70 boys and 49 girls reported that they had tried to smoke or used to smoke more often. The gender differences in percentages are shown in Figure 3.

Figure 3 Lifetime prevalence of tobacco smoking in percentages among early adolescents by gender

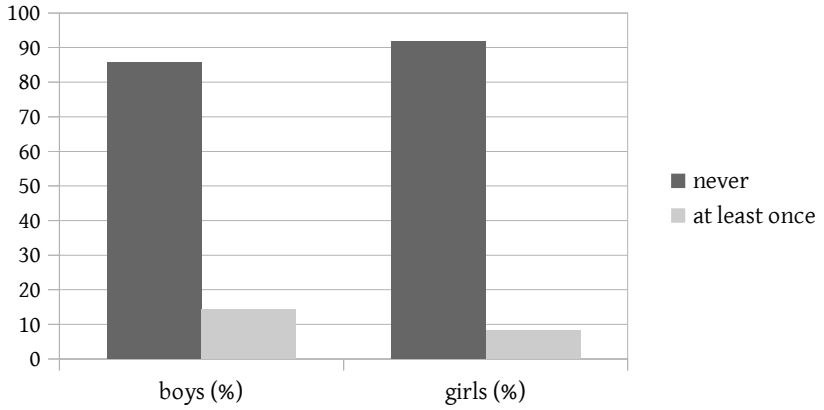


Table 3 shows the results of the logistic regression analysis with lifetime prevalence of tobacco smoking. The dependent variable was dichotomized (never tried to smoke cigarettes; tried to smoke cigarettes). The model contained one control variable (gender) and six independent variables (parental monitoring, self-control, self-liking, novelty seeking, emotional regulation, positive future orientation). As can be seen, there are four independent variables that contribute significantly to the explanatory ability of the model – gender, parental monitoring, self-liking and positive

future orientation. If the adolescent is a boy with a lower level of parental monitoring, lower level of self-liking and a lower level of positive future orientation then the probability of tobacco smoking is higher. The model correctly classified 91 % of cases overall. The full model containing all predictors was statistically significant (=20.2, df=7, p=0.017). The model explained between 4.8 % and 10.6 % of the variance in the occurrence of lifetime experiences of tobacco smoking.

Table 3 Logistic regression model of lifetime experiences of tobacco smoking among early adolescents

		Cox & Snell R^2 = 0.048; Negelkerke R^2=0.106			
	B	Sig.	Exp(B)	95% C.I.	
gender[a]	-0.644	0.036	0.525	0.287	0.960
parental monitoring	-0.092	0.011	0.912	0.849	0.979
self-control	0.025	0.181	1.026	0.988	1.065
self-liking	-0.085	0.029	0.919	0.851	0.991
novelty seeking	-0.079	0.094	0.924	0.843	1.013
emotional regulation	0.022	0.527	1.022	0.955	1.095
positive future orientation	0.096	0.024	1.101	1.013	1.197
constant	0.549	0.761	1.732		

Note: [a]men as the reference group

Excessive computer gaming

Excessive playing of computer games was another type of problem behavior that was studied. The existence of the problem has been represented by everyday playing computer games. Figure 4 shows the relative frequency of playing PC games according to gender. There were 414 (266 boys) everyday players among the respondents.

Early adolescent boys with a lower level of parental monitoring were more likely to behave more riskily. The other independent variables were not significant in the model. The full model of excessive computer gaming was statistically significant (=57.3, df=7, p<0.001). The model explained between 9.8 % and 13.3 % of the variance of the dependent variable and correctly classified 66.8 % of the cases overall (Table 4).

Figure 4 Relative frequency of playing computer games according to gender

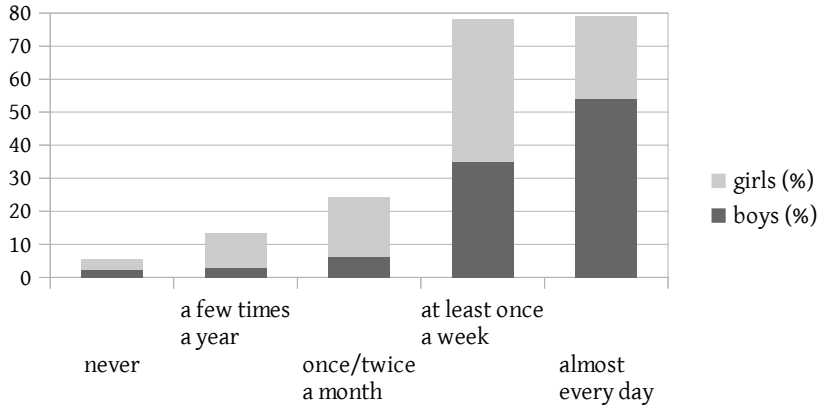


Table 4 Logistic regression model of excessive computer gaming among early adolescents

		Cox & Snell R^2 = 0.098; Negelkerke R^2=0.133			
	B	Sig.	Exp(B)	95% C.I.	
gender[a]	-1.261	<0.001	0.283	0.197	0.408
parental monitoring	-0.047	0.048	0.954	0.911	1.000
self-control	0.005	0.687	1.005	0.982	1.029
self-liking	0.030	0.200	1.030	0.984	1.078
novelty seeking	0.031	0.310	1.031	0.972	1.095
emotional regulation	0.008	0.719	1.008	0.967	1.050
positive future orientation	0.015	0.564	1.015	0.964	1.070
constant	-1.057	0.339	0.347		

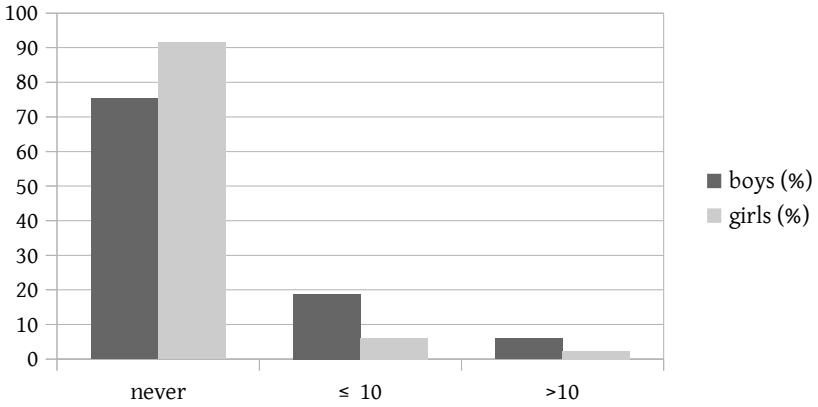
Note: [a]men as the reference group

Fighting in school

There is an apparent difference between boys and girls in the frequency of fighting with schoolmates (Figure 5). 46 girls and 112 boys referred that they had got mixed up in a fight at school during the last 12 months.

Gender is significantly linked to problematic behavior at school such as fighting with peers. Boys tended to fight more frequently compared to girls. But lower levels of self-liking and emotional regulation also contribute significantly to the predictive ability of the model which explained about 7.5-12.9 % of the variance of the dependent variable (Table 5). The full model containing all predictors (gender, parental monitoring, self-control, self-liking, novelty seeking, emotional regulation, positive future orientation) was statistically significant (=42.5, df=7, p<0.001) and correctly classified 84.7 % of the cases.

Figure 5 Prevalence fighting at school in percentages among early adolescents by gender



Damaging school property on purpose

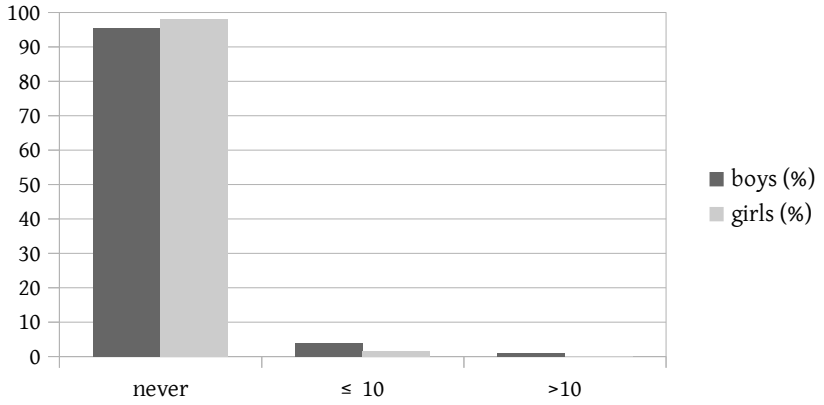
Most of the respondents did not report damaging school property on purpose (Figure 6). Only 21 boys and 10 girls stated that they had damaged school property on purpose in the previous 12 months. Table 6 shows the results for problematic behavior – damaging school property. The full model containing all predictors was statistically significant (=19.2, df=7, p=0.007). It explained between 3.5 % and 18.2 % of the variance in the occurrence of damaging school property. Only two of the six predictors were significant – self-control and emotional regulation.

Table 5 Logistic regression model of fighting at school among early adolescents

		Cox & Snell R^2 = 0.075; Negelkerke R^2=0.129			
	B	Sig.	Exp(B)	95% C.I.	
gender	-1.311	<0.001	0.269	0.161	0.450
parental monitoring	-0.031	0.313	0.970	0.913	1.030
self-control	0.008	0.598	1.008	0.978	1.040
self-liking	-0.082	0.008	0.921	0.867	0.979
novelty seeking	-0.057	0.148	0.944	0.874	1.021
emotional regulation	0.061	0.034	1.063	1.005	1.125
positive future orientation	0.002	0.956	1.002	0.935	1.073
constant	0.807	0.580	2.240		

Note: [a]men as the reference group

Figure 6 Prevalence of damaging school property on purpose in percentages among early adolescents by gender



Juvenile boys and girls with lower levels of these variables would tend to damage school property (usually school desks, chairs, walls, some kind of school supplies etc.). The model correctly classified 97.8 % of the cases overall.

Shoplifting

Similarly to damaging school property, shoplifting was not a common problem in the group of early adolescents (Figure 7). Only 12 boys and 8 girls confessed that they had taken something from a shop without paying for it.

Table 6 Logistic regression model of damaging school property on purpose among early adolescents

		Cox & Snell R^2 = 0.035; Negelkerke R^2=0.182			
	B	Sig.	Exp(B)	95% C.I.	
gender[a]	-0.154	0.804	0.857	0.254	2.891
parental monitoring	-0.003	0.971	0.997	0.862	1.153
self-control	0.125	0.011	1.133	1.029	1.247
self-liking	-0.038	0.607	0.962	0.832	1.114
novelty seeking	0.013	0.892	1.013	0.838	1.224
emotional regulation	0.161	0.045	1.174	1.004	1.374
positive future orientation	0.116	0.193	1.123	0.943	1.337
constant	-12.339	0.004	0.000		

Note: [a]men as the reference group

The full binary logistic regression model for problematic behavior - stealing in a shop containing all predictors was statistically significant (=19.2, df =7, p=0.008). The model explained between 3.5% and 19.3% of the variance of the dependent variable and correctly classified 98 % the cases.

As reported in Table 7, only two of the independent variables made a statistically significant contribution to the model – parental monitoring and self-control. The probability of stealing in the shop is higher among adolescents with a lower level of self-control and lower level of parental monitoring. On the other hand gender, self-liking, novelty seeking, emotional regulation and positive future orientation did not appear to be significant in the model.

Figure 7 Prevalence of shoplifting in percentages among early adolescents by gender

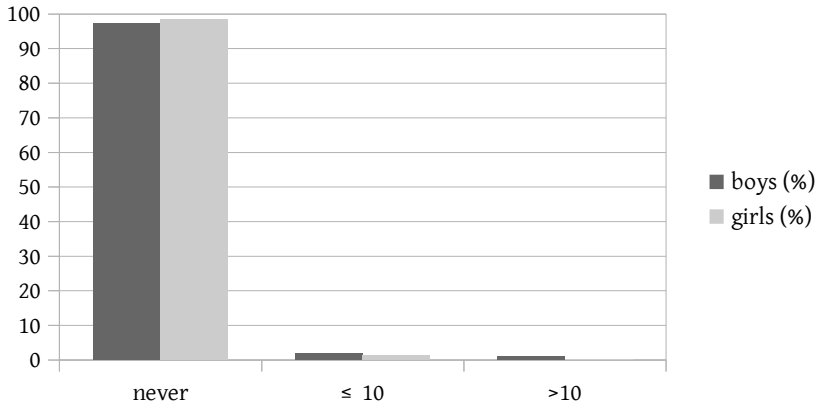


Table 7 Logistic regression model of shoplifting among early adolescents

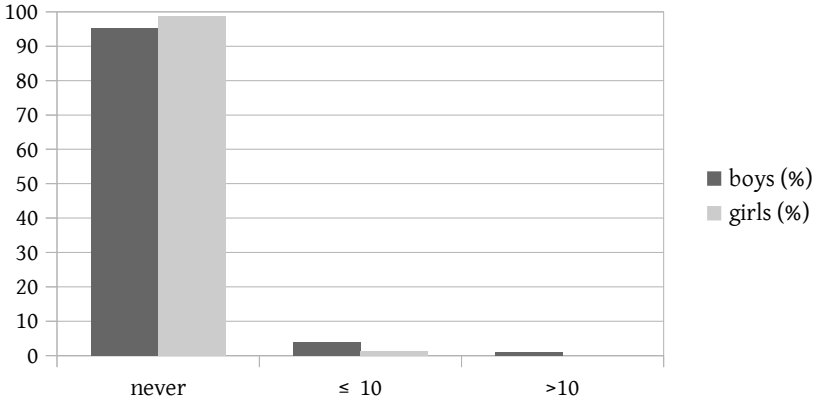
		Cox & Snell R^2 = 0.035; Negelkerke R^2=0.193			
	B	Sig.	Exp(B)	95% C.I.	
gender[a]	-0.291	0.654	0.747	0.209	20.667
parental monitoring	-0.151	0.041	0.860	0.743	0.994
self-control	0.113	0.015	10.119	10.022	10.226
self-liking	-0.064	0.400	0.938	0.809	10.088
novelty seeking	0.031	0.769	10.031	0.841	10.264
emotional regulation	0.117	0.139	10.125	0.963	10.314
positive future orientation	-0.077	0.419	0.926	0.768	10.116
constant	-60.366	0.121	0.002		

Note: [a]men as the reference group

Getting into trouble with the police

As can be seen in Figure 8, more than 95 % of the respondents had never been in trouble with the police for something they had done. There are almost significant gender differences with boys being in trouble more frequently. 21 boys and 7 girls confessed that they had got into trouble with the police.

Figure 8 Prevalence of getting into troubles with the police in percentages among early adolescents by gender



As shown in Table 8, there was only one independent variable that contributed significantly to the explanatory ability of the model of getting into trouble with the police as the dependent variable. According to the regression model, adolescents with a higher probability to have trouble with the police were those with a lower level of self-control. The full model was statistically significant (=18.5, df=7, p=0.010). It explained between 3.4 % and 18.6 % of the variance of dependent variable and model correctly classified 98 % of the cases overall.

Running away from home

The respondents were asked if they had ever run from home for more than one day and the distribution of answers is shown in Figure 9. Approximately 96 % of the boys and 98 % of the girls had never run from home. Only 15 boys and 8 girls stated that they had ever ran away from home.

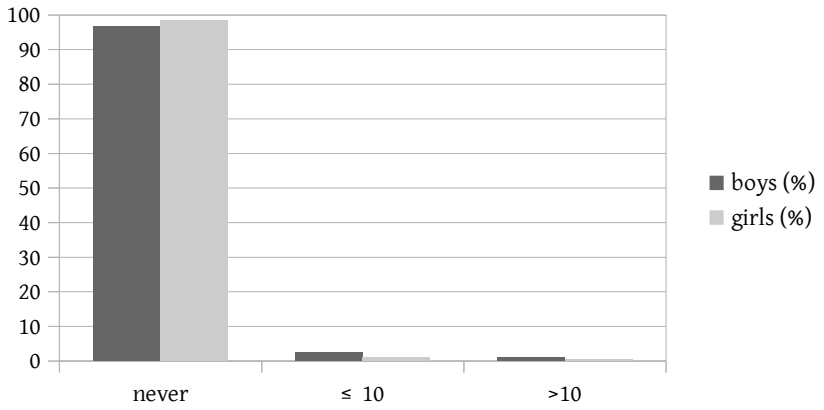
In the multivariate binary regression analysis shown in Table 9, only two variables - self-liking and emotional regulation were negatively significantly associated with running away from home. The full model containing all predictors was statistically significant (=18.1, df =7, p=0.008). It explained between 3.4 % and 17.9 % of the variance of the dependent variable and it correctly classified 98 % of the cases.

Table 8 Logistic regression model of getting into trouble with the police among early adolescents

		Cox & Snell R^2 = 0.034; Negelkerke R^2=0.186			
	B	Sig.	Exp(B)	95% C.I.	
gender	-1.370	0.053	0.254	0.063	1.016
parental monitoring	-0.069	0.365	0.934	0.805	1.083
self-control	0.142	0.004	1.153	1.046	1.272
self-liking	-0.068	0.374	0.934	0.804	1.086
novelty seeking	-0.092	0.339	0.912	0.755	1.102
emotional regulation	0.038	0.591	1.039	0.904	1.194
positive future orientation	0.078	0.399	1.081	0.902	1.294
constant	-5.212	0.169	0.005		

Note: [a]men as the reference group

Figure 9 Prevalence of running away from home in percentages among early adolescents by gender



The next two kinds of problem behavior are different. The first of them is thinking about self-harming and the second one concerned suicide attempts of juvenile boys and girls.

Self-harming thoughts

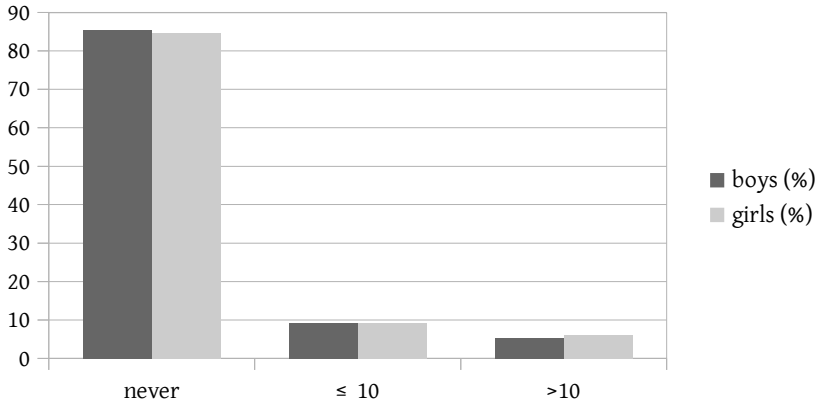
The lifetime prevalence of self-harming thoughts was not very high, but about 15 % of juvenile girls (N= 82) and boys (N=65) had thought about hurting themselves (Figure 10).

Table 9 Logistic regression model of running away from home among early adolescents

		Cox & Snell R^2 = 0.034; Negelkerke R^2=0.179			
	B	Sig.	Exp(B)	95% C.I.	
gender	-0.698	0.264	0.498	0.146	1.694
parental monitoring	0.051	0.505	1.053	0.905	1.224
self-control	-0.050	0.164	0.951	0.887	1.021
self-liking	-0.186	0.023	0.830	0.707	0.974
novelty seeking	0.017	0.866	1.017	0.838	1.234
emotional regulation	0.166	0.036	1.181	1.011	1.379
positive future orientation	0.021	0.785	1.022	0.875	1.192
constant	-2.878	0.501	0.056		

Note: [a]men as the reference group

Figure 10 Prevalence of self-harming thoughts in percentages among early adolescents by gender



Logistic regression analysis shows that lower emotional regulation and a lower level of self-liking and a higher level of self-control are linked to self-harming thoughts among early adolescent boys and girls. The full model containing all predictors was statistically significant (=40.3, df =7, p<0.001). It explained between 7.2 % and 12.3 % of the variance of the dependent variable and it correctly classified 84.2 % of the cases (Table 10). Gender, parental monitoring, novelty seeking and positive future orientation did not contribute significantly to the explanatory ability of the model.

Table 10 Logistic regression model of self-harming thoughts among early adolescents

		Cox & Snell R^2 = 0.072; Negelkerke R^2=0.123			
	B	Sig	Exp(B)	95% C.I. for EXP(B)	
gender	-0.182	0.463	0.833	0.512	1.356
parental monitoring	-0.032	0.296	0.968	0.911	1.029
self-control	0.050	0.002	1.052	1.018	1.086
self-liking	-0.101	0.001	0.904	0.850	0.962
novelty seeking	-0.014	0.723	0.986	0.912	1.066
emotional regulation	0.071	0.016	1.074	1.014	1.137
positive future orientation	-0.048	0.186	0.953	0.887	1.024
constant	-0.801	0.590	0.449		

Note: [a]men as the reference group

Suicide attempts

Figure 11 shows the prevalence of suicide attempts among early adolescents. As can be seen, about 3% (N=15) of the boys and 2 % (N=12) of the girls reported a suicide attempt.

Lower levels of parental monitoring and a negative self-attitude (a lower level of self-liking) are significant factors that contribute significantly to the explanatory ability of the model for suicide attempts of juveniles. The full model was statistically significant (=33.6, df =7, p<0.001). It explained between 6 % and 35.8 % of the variance of the dependent variable and it correctly classified 98.3 % of cases (Table 11).

Figure 11 Prevalence of suicide attempts in percentages among early adolescents by gender

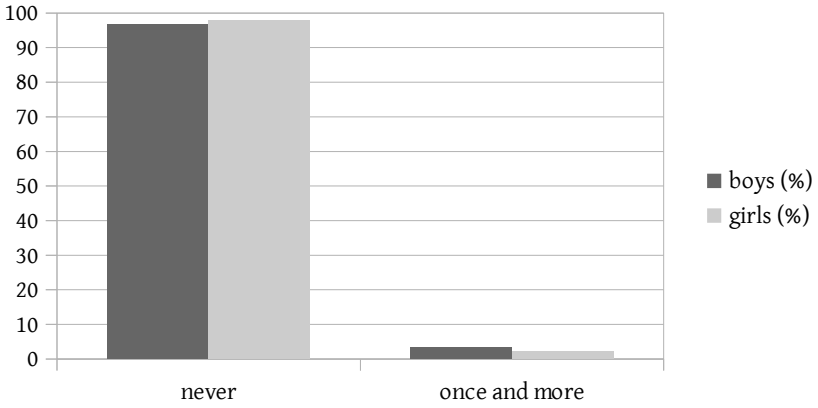


Table 11 Logistic regression model of suicide attempt among early adolescents

		Cox & Snell R^2 = 0.068; Negelkerke R^2=0.358			
	B	Sig.	Exp(B)	95% C.I.	
gender	0.128	0.862	1.137	0.268	4.817
parental monitoring	-0.280	0.003	0.756	0.630	0.908
self-control	0.063	0.186	1.065	0.970	1.169
self-liking	-0.311	0.002	0.732	0.602	0.890
novelty seeking	-0.016	0.875	0.984	0.805	1.203
emotional regulation	0.049	0.580	1.051	0.882	1.252
positive future orientation	0.175	0.091	1.191	0.972	1.459
constant	1.928	0.693	6.875		

Note: [a]men as the reference group

The significant findings are summarized and shown in Table 12. Regardless of the type of problem behavior the most common correlates seems to be parental monitoring, self-control, self-liking and emotional regulation. Boys are more risky compared to girls only in alcohol consumption, tobacco cigarettes smoking, fighting and excessive computer gaming. All types of self-destructive behavior including running away from home are linked to self-liking. Delinquent behavior is strongly associated with self-control. Positive future orientation is important in predicting the use of legal drugs.

Table 12 Significant associations between types of problem behaviors and independent variables

	G p B	PM p B	PED p B	NED p B	SC p B	SL p B	NS p B	ER p B	PFO p B
lifetime alcohol consumption	0.032 -0.529	-	<0.001 -0.122	0.001 0.079	-	-	0.013 -0.097	-	0.027 0.079
lifetime prevalence of drunkenness		-	0.028 -0.122	-	-	-	-	0.028 0.125	-
tobacco cigarettes smoking	0.036 -0.644	0.011 -0.092	-	-	-	0.029 -0.085	-	-	0.024 0.096
excessive computer gaming	<0.001 -1.261	0.048 -0.047	-	-	-	-	-	-	-
fighting at school	<0.001 -1.311	-	-	-	-	0.008 -0.082	-	0.034 0.061	-
damaging school property on purpose	-	-	-	-	0.011 0.125	-	-	0.045 0.161	-
shoplifting	-	0.041 -0.151	-	-	0.015 0.113	-	-	-	-
getting into trouble with the police	-	-	-	-	0.004 0.142	-	-	-	-
running away from home		-	-	-	-	0.023 -0.186	-	0.036 0.166	-
self-harming thoughts		-	-	-	0.002 0.050	0.001 -0.101	-	0.016 0.071	-
suicide attempts	-	0.003 -0.280	-	-	-	0.002 -0.311	-	-	-

G=Gender; PM=Parental monitoring; PED=Positive expectations of drinking; NED=Negative expectations of drinking; SC=Self-control; SL=Self-liking; NS=Novelty seeking; ER=Emotional regulation; PFO=Positive future orientation

Discussion

The aim of this study was to gain insight into various types of problem behavior (alcohol consumption, tobacco cigarettes smoking, excessive gaming, fighting at school, damaging school property, stealing, trouble with police, running away from home and self-harming thoughts and/or behavior) among Slovak early adolescents and their associated factors. The research sample consisted of early adolescent girls and boys from a stratified random sample. The respondents attended 6th grade of primary school and were about 12 years old.

Among the studied factors, positive expectations of drinking had the strongest association with the both alcohol related variables used – lifetime prevalence of alcohol consumption and lifetime prevalence of being drunk. Gender was only a significant correlate for lifetime prevalence of alcohol consumption which is consistent with observations from many previous studies (Burešová & Vacek, 2012; Csémy, Hrachovinová, & Krch, 2004; Dawson et al. 2007). Regarding lifetime prevalence of drunkenness there were no differences according to gender. These findings may be linked to the declining difference between genders in alcohol-related variables as referred to in some studies (Minor Blumer et al., 2010). Almost the same percentages of boys and girls have experienced excessive drinking leading to drunkenness, which could be caused by biological differences between men and women when a different level of alcohol consumption brings the same effect (Slutske et al., 1995).

A negative expectation of alcohol consequences and resilience factors, novelty seeking and positive future orientation contribute significantly to the alcohol consumption of juveniles.

It was found that there were significant gender differences in lifetime prevalence of alcohol consumption, tobacco smoking, excessive computer gaming and fighting at school. In all cases boys were more risky than girls. The results are consistent with other research (Carlo et al, 1999, Kokkevi et al., 2014). However, the study did not find any significant associations between gender and self-destructive behavior as was referred to by Kokkevi et al.(2014).

Parental monitoring seemed to be a very important protective factor and is negatively associated to tobacco cigarettes smoking, excessive computer gaming, shoplifting and suicidal attempts. A number of studies have supported the assumption that parental support, control and monitoring are negatively related to

problem behavior such is alcohol misuse, use of other substances and delinquent behavior (Farrell & Dintcheff, 2006, Georgiou, 2008, Kelly et al., 2012, Patterson & Stouthamer-Loeber, 1984 in Batool, 2013, Simons – Morton, 2002).

Self-control and emotional regulation were important protective factors of various types of problem behavior such is aggressive behavior – damaging school property and fighting at school, antisocial behavior – shoplifting, trouble with the police and self-destructive behavior such as running away from home, self-harming thoughts and suicidal attempts.

The results further showed that a positive attitude towards oneself – self-liking is negatively associated to smoking, fighting at school and all studied types of self-destructive behavior (running away from home, self-harming thoughts, suicidal attempts). Some other researchers found that self-control and self-liking are protective factors towards problem behavior (Carlos & Sharma, 2012, Donnellan et al., 2005, Finkenauer, Engels, & Baumeister, 2005, Orosová et al., 2007).

A high level of novelty seeking was the only significant factor linked to alcohol drinking and a low level of positive future orientation was associated with alcohol drinking and tobacco cigarettes smoking.

FUTURE RESEARCH

Future studies should continue to explore the relationship between various types of problem behavior and personality traits, social and family variables. Future research should include other forms of problem behavior which are more common among adolescents e.g. distraction in class, low respect towards teachers, using vulgar expressions, lying and cheating. It would be useful to compare the prevalence and factors of problem behavior of young people across various age groups or in a longitudinal study.

LIMITATIONS

The findings of the study should be interpreted with caution as it contains certain limitations. Firstly, all the analyses are based on self-reported data. It is important that future research assesses other sources of information (parents, teachers, peers) to collect different perceptions about these variables. Secondly, the frequency of some types of studied behavior was very low in the research sample. In a future study, both early and late adolescent groups should be included and problem behavior which is more common should be studied in each age group. Thirdly, some of the questionnaires used in the research were primarily aimed at

an older age group and some of the reliability coefficients were low.

Implication for practice

Despite these limitations, the findings have practical implication for prevention and intervention of problem behavior among adolescents. It will be important to cooperate with parents and highlight the important role of parental monitoring and support. Parents should be targeted to increase their capacity to provide support to and monitoring of their adolescent children. When designing preventive programs emphasis should be placed on the real effects of alcohol use and on strengthening self-control, emotional regulation and positive attitude toward oneself.

Conclusions

The study has contributed to the understanding of correlates of problem behavior in early adolescence. Despite several limitations, the results of the study may prove useful in creating and implementing prevention and intervention programs in relation to different types of problem behavior.

Legal drugs and self-system among schoolchildren

Introduction

There is considerable agreement regarding the importance of the self in behavior, adjustment and development of adolescents. However, it is much less clear which components of the self are the most important and how is the self actually shaped through social interaction and which functions it performs (Kiang, Harter, 2008).

As a comprehensive term for the multifaceted content of self-reflection the term self-system has been suggested (Macek, 2008). Self-system has been defined as an organized, dynamic and causally linked arrangement of thoughts, feelings and motives which together shape human experience. In relation to this, Macek (2008) further explains the Dual theory of self-reflection based on James' ideas (1890). According to this theory, one part of self-reflection is represented by the „I“ as a subject who is aware of something. Then there is the “self” as an object of perception consisting of thoughts and assessments which are ascribed to the „self”, as an object in the focus of awareness and perception. When a person is addressed as a whole different domains can be distinguished. In particular, the physical, the social and the psychological domain. In addition, the self-reflection processes produce an autobiographical narrative and this way reconstruct the past or project into the future (Vago, Silbersweig, 2012).

Self-system as an object consists of cognitive (self-concept), affective (self-esteem) and behavioral (self-efficacy, self-regulation, self-actualization) areas. It can be viewed in relation to behavior related to health as a general, non-specific risk and protective factor. For example, it is an essential component of mental, social as well as physical health and well-being (Mann, Hosman, Schaalma et al., 2004). Longitudinal studies have shown that there is a link between low self-concept, low unstable negative self-esteem, low self-efficacy and the present as well as the future risk behavior (Wild, Flisher, Bhana et al., 2004).

The cognitive aspect of self-system and self-concept concerns the content and the structure of self-system. Cognitive structures stored in the memory fit the best the processual level of self-knowledge and self-understanding (Macek, 2008). The knowledge about oneself with regard to personal characteristics, social characteristics, moral characteristics and physical appearance is in some way a cognitively organized structure (self as scheme, as a prototype, as a categorical hierarchical structure, as an associative system). All of the following attributes of the self, such as real, ideal, perceived, presented, possible, undesirable are the classic aspects of the self–concept (Blatný, 2010).

Newer theories of the self-concept address the following: self-concept complexity (Linville, 1987), self-concept clarity (Campbell et al., 1996) and self-concept differentiation (Diehl, Hay, 2011). These are the forms of understanding the structure and functions of self-concept. The self-concept complexity is the extent to which individuals have many different and relatively independent ways of thinking about themselves. Self-concept complexity is the number of self-aspects (Linville, 1987). Self-concept differentiation is a structural aspect of the self-concept (Diehl, Hay, 2011) and is defined as the extent to which person's self-representations vary across social roles or situations.

Self-concept clarity is the extent to which the content of person's self-concept is clearly and confidently defined, internally consistent and temporally stable (Campbell et al., 1996). The clarity of knowledge about the self-concept can be considered as a meta-cognitive aspect of the self. This is a construct that characterizes a specific property of self-view but not the actual content of self-view. Self-concept clarity increases with age and has been found to be associated with well-being (Diehl, Hay, 2011). Findings (Lee-Flynn et al., 2011) point to the vulnerability of those having low self-concept clarity in terms of both short and long-term adaptation to stress. On the other hand, a high level of the trait self-concept clarity correlates with numerous positive outcomes, these include high global self-esteem and low neuroticism (Campbell, Assanand, Paula, 2003). High self-concept clarity has been also found to be associated with more adaptive coping skills (Campbell, Assanand, Paula, 2003).

Self-esteem and legal drugs

Self-esteem is the evaluative and affective dimension of the self-system and is considered to be equivalent to self-regard, self-estimation and self-worth. It refers to a person's global appraisal of his/her positive or negative attributes and is based on the scores a person gives him/herself in different roles and domains of life. Positive self-esteem is not only seen as a basic feature of mental and physical health but is also perceived as a protective factor which contributes to better health and positive social behavior through its role as a buffer against the impact of negative influences. It can be said that healthy self-esteem can serve as a defense mechanism that promotes well-being by protecting internal balance and by adequate perception of reality as a basic element of mental health. Optimism, happiness, hope and positive self-esteem are variables related to substance use avoidance by adolescents. This is mediated by attitudes, perceived norms and perceived behavioral controls (Carvajal et al., 2000). Controversially, an unstable self-concept and poor self-esteem can play a critical role in the development of an array of mental disorders and social problems, such as depression, anxiety, eating disorders, delinquency, substance abuse and high-risk behavior, school dropout, social functioning, academic success and satisfaction (Mann, Hosman, Schaalma et al., 2004), self-esteem should be examined not only as a cause, but also as a consequence of these problem behaviors (Mann, Hosman, et al., 2004).

Self-esteem is essentially an esthetic or evaluative phenomenon. It can be understood as the distinction between instrumental and intrinsic value. According to Tafarodi and Swann (1995, 2001) self-competence and self-liking can be considered as the two basic sources of self-esteem. Self-competence refers to the generalized experience of self-efficacy and power. Self-liking refers to a generalized experience of rating oneself as a social object. Self-competence is a relatively autonomous agent which is in constant correspondence with one's goals and expectations in the process of implementing these goals and intentions. It is relatively well objectified. On the other hand, self-liking is based on reliance, references and reflections based on socially communicated values. It is dependent on the values based on normative criteria while self-competence is not. The relative independence of these two components may also be present in the internal inconsistencies when self-competence and self-liking acquire opposite polarity, for example, in risk behaviors.

Self-efficacy and legal drugs

Self-efficacy is a volitional, motivational and behavioral aspect of the self-system. It has been defined as beliefs in one's capabilities to organize and execute the courses of action required to produce given levels of attainment (Bandura, 1997, Prestwich et al., 2013). People with certain of efficacy believe they can accomplish a difficult task. They tend to perceive it as challenge to be mastered, rather than a threat which needs to be avoided. Self-efficacy can be this way understood to a certain extent as an effort for self-assertion and self-realization. Bandura has operationalized self-efficacy in terms of specific self-efficacy (for example social self- efficacy). Schwarzer and Jerusalem (1995) have further defined self-efficacy as a general capacity independent of specific situation.

Bandura (1997) has proposed four sources of self-efficacy: performance accomplishments, vicarious experience, verbal persuasion and physiological states. Self-efficacy as a system of internal attributions has a predictive power with regard to current and future behavior (Schwarzer, 2009). Moreover, it is directly involved in the process of learning as well as maintaining health-related behaviors. And perhaps even more importantly self-efficacy is directly involved in the process of stopping health-compromising behavior.

Schomerus et al. (2011) and Kim (2011) have also found support for the association between health risk behaviors and psychological variables. They have further suggested that self-esteem and self-efficacy have a significant effect on smoking and drinking alcohol.

The research has further demonstrated that the self-efficacy to resist smoking is related to adolescent smoking (Chen, Horner, Percy et al., 2008). Therefore, self-efficacy is an important construct to consider in studies focusing on smoking initiation and opportunity/refusal smoking. Young adolescents' perceptions of their efficacy to resist smoking has been further shown to be associated with their decision to start smoking (Chen et al., 2008). Furthermore, moderating effect of self-efficacy in the relationship between stress and cigarette smoking among young adolescents was found by Golestan and Abdullah (2015).

Adolescents, faced with drug offers, must feel that they are efficacious in resisting these offers and also must believe that

their refusal strategies will be an effective refusal response. The authors Choi, Krieger and Hecht (2013) have argued that there are two types of efficacy: refusal response efficacy (in their study they explored refusal, explanation, avoidance, and leaving as refusal strategies) and specific substance refusal self-efficacy (for example alcohol or smoking resistance). Refusal response efficacy and specific substance refusal self-efficacy (alcohol, smoking cigarettes) have been found to be negatively related to alcohol use and smoking.

Self-system, age and gender

Age and gender are important factors in the process of development and maturation and especially with regard to self-system which undergoes significant changes during adolescence. A relatively well-elaborated self-system research is centered on the developmental stage of late adolescence. During this period girls report lower level of self-esteem when compared with boys (Blatný, 2010). Less frequently, this topic is explored on the samples of older school age and early adolescence which is the 11-12th year of life. During this period physical and subsequently psychological changes related to the development take place. These changes are highly relevant for the development of self-system. However, this is also a critical age for the first time experience with legal drugs and involvement in risk behaviors.

Aim

The aim of this study is to examine the relationship between self-system (self-concept: self-concept clarity, the dimensions of self-esteem: self-liking, self-competence, negative and positive self-esteem, aspects of self-efficacy: general and social, refusal cigarettes, refusal alcohol) and legal drugs (alcohol use and smoking cigarettes) among early and middle adolescents.

Sample

The role of self-system in risk behavior was investigated on the sample consisting of early adolescent students (N=1298, 43.6% boys, mean age=11.5; SD±0.61) and on the sample of middle adolescent students (N=741, 48.5% boys, mean age=14.7; SD±0.90) at primary schools. We used data from the APVV- 0253-11 and the APVV- 20-038 205 projects. Trained researchers and research assistant collected the data. The set of questionnaires was administrated during two regular 45-minute classes (90-minutes in total) on a voluntary and anonymous basis and without the presence of the teachers. The local Ethics Committee approved the study.

Measures

Self-concept. In the early adolescent sample self - concept was measured using the Self-concept clarity scale consisting of 12 items. In this scale the responses range on the 5-point Likert scale from 1 (strongly disagree) to 5 (strongly agree). Higher scores indicate higher clarity of self-concept (Campbell et al., 1996). Cronbach's alpha in our sample was 0.73.

Self-esteem. The Self-liking/self-competence scale - revised version was used for measuring self-liking (8 items) and self-competence (8 items) in early adolescence. In this instrument a 5-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree) was used. Higher scores indicated higher self-liking and self-competence (Tafarodi, Swann, 2001). Cronbach's alpha for the self-liking subscale was 0.81 and for the self-competence competence 0.82. The items were also divided based on their positivity (8 items) Cronbach's alpha 0.81and negativity (8 items) Cronbach's alpha 0.74. In this operationalization higher scores indicated higher positive and negative self-esteem, respectively (Tafarodi, Swann, 2001).

The original *Self-liking/Self-competence scale* was used for measuring self-liking (10 items) and self-competence (10 items) in the middle adolescent sample (Tafarodi, Swann, 1995). Cronbach's alpha for the self-liking subscale was 0.81 and for the self-competence subscale 0.82 for this group. For measuring positive and negative self-esteem the Rosenberg Self-esteem scale (RSES) was used (Rosenberg, 1965). The 10 items of the RSES assess a person's overall evaluation of his /her worthiness as a human being (Rosenberg, 1965) The RSES can be divided into an equal number of positively and negatively worded items measuring positive and negative self-esteem. Responses range on a 4-point scale from 1 (strongly disagree) to 4 (strongly agree). A higher score indicates higher positive and negative self-esteem. Cronbach's alpha for the positive self-esteem subscale was 0.78 and for the negative self-esteem subscale 0.66.

Self-efficacy. In the early adolescent sample the Self-efficacy scale (revised version) was used for measuring general self-efficacy (Košč, Hefteyová, Schwarzer et al., 1993). In this scale the responses are measured on 10 items using a 4-point Likert scale ranging from 1 (strongly disagree) to 4 (strongly agree). A higher score indicates higher general self-efficacy. Cronbach's alpha for the general self-efficacy scale was 0.90.

In the middle adolescent sample the Self-efficacy scale (original version) was used for measuring the general (17 items) and the social (6 items) self-efficacy. In this scale responses range on a 5-point Likert scale from 1 (strongly disagree) to 5 (strongly agree). A higher score indicates higher self-efficacy (Sherer et al., 1982). Cronbach's alpha was 0.82 for the general self-efficacy and 0.61 for the social self-efficacy.

Opportunities for smoking and drinking and refusal skills. Self-reported questionnaires from the International study ESPAD were used in the sample of early adolescents. Opportunity/refusal smoking were addressed with the question: How many times did you have the opportunity to try cigarettes and you did not? (1-once or twice, 6-40 times or more). Opportunity/refusal alcohol: How many times did you have the opportunity to try alcohol and you did not? (1-once or twice, 6-40 times or more).

*Legal drugs. L*ifetime prevalence of smoking cigarettes, alcohol consumption and prevalence of drunkenness was explored in the sample of early adolescent students with the questions "On how many occasions (if any) have you smoked cigarettes in your life-time?", "On how many occasions (if any) have you had any alcoholic beverages to drink in your life-time?", "On how many occasions (if any) have you been intoxicated in your life-time (for example: staggered, could not speak properly, did not remember what happened the day before?)" with possible answers: 0, 1-2, 3-5,6-9,10-19,20-39, 40 or more. Lifetime prevalence of smoking cigarettes, alcohol consumption and prevalence of being drunk was dichotomized and served as dependent variables (0=without prevalence, 1=prevalence).

The middle adolescent students were asked about their experience with smoking and regular use of cigarettes. These respondents were asked to indicate whether they had ever had a cigarette in their lives with possible answers: (1) never, (2) I have tried it, (3) I had smoked in the past, but I stopped, (4) I smoke time to time, but not daily and (5) I smoke daily. The responses to this question were dichotomized for the purposes of logistic regression into groups with and without experience with tobacco cigarettes smoking (0=1; 1=2+3+4+5). The responses to this question were also dichotomized into groups with and without daily smoking (0=1+2+3+4; 1=5). The respondents were also asked about the frequency of drunkenness during the past four weeks. This was measured with the following set of

possible answers (1) never, (2) once or twice, (3) three times and more and dichotomized for logistic regression analyses (0=1;1=2+3).

Statistical Analyses

Binary logistic regression was used for the analysis and was carried out separately for males and females in the early and middle adolescent groups.

Results

The first set of univariate models in the sample of early adolescents consisted of the following independent variables: self-liking, self-competence, positive self-esteem, negative self-esteem, general self-efficacy, opportunity/refusal smoking, opportunity/refusal alcohol. The lifetime prevalence smoking, alcohol use and drunkenness were used as the dependent variables. In the second set of models the same independent and dependent variables were used but a multivariate approach was applied.

The first set of univariate models, in the sample of middle adolescents, consisted of the following independent variables: self-concept, self-liking, self-competence, positive self-esteem, negative self-esteem, general self-efficacy, social self-efficacy. Experience with smoking, regular use of cigarettes and being drunk during in the last 4 weeks were used as the dependent variables. Similar to the early adolescent group the second set of models used the same independent and dependent variables but a multivariate approach was applied.

Descriptive analyses (Table 13) revealed significant differences between boys and girls regarding lifetime prevalence smoking and alcohol use. Boys had higher levels in all of these behaviors. In the early adolescent sample, there were no significant differences in the self-system with regard to gender.

In Table 14 the correlations between aspects of self-system are shown. The highest positive correlation was found between self-liking and positive self-esteem and the highest negative correlations were found between negative self-esteem and self-competence. Smoking refusal skills correlated only with opportunity/refusal alcohol.

Table 13 Descriptive statistics for self-system and lifetime risk behavior in early adolescence

	boys		girls		p
lifetime prevalence smoking	70	14.0%	49	8.2%	0.002
lifetime prevalence alcohol use	119	23.8%	78	13.1%	0.000
lifetime prevalence drunkenness	31	6.2%	30	5.0%	0.398
opportunity/refusal smoking	2.89	1.57	2.68	1.30	0.211
opportunity/refusal alcohol	2.88	1.38	2.65	1.21	0.230
self-liking	27.79	4.26	27.49	4.02	0.295
self-competence	24.90	3.81	24.77	3.62	0.596
positive self-esteem	27.45	6.08	27.39	5.07	0.866
negative self-esteem	22.54	5.54	23.10	4.94	0.118
general self-efficacy	27.81	7.10	28.60	5.75	0.067

Table 14 Correlations for self-system for 11.5 aged students

		1	2	3	4	5	6	7
1	self-liking	1						
2	self-competence	,406**	1					
3	positive self-esteem	,604**	·454**	1				
4	negative self-esteem	-,427**	-,539**	,266**	1			
5	self-efficacy general	,271**	,282**	,422**	,039	1		
6	opprotunity/refusal smoking	-,045	-,065	,018	-,057	-,062	1	
7	opportunity/refusal alcohol	-.049	-..073	-.054	,061	,021	,487**	1

Table 15 shows the associations of self-system with lifetime smoking, alcohol use and drunkenness with estimated odds ratios (95% confidence intervals) of all self-system covariates for boys in early adolescence. In the univariate analyses, positive self-esteem and opportunity/refusal smoking was significantly associated with lifetime smoking. Opportunity/refusal alcohol was significantly associated with life time alcohol use and lifetime drunkenness. Positive self-esteem was related to decreased smoking. Opportunity/refusal smoking and alcohol increased smoking, drinking and drunkenness.

Table 15 The associations between self-system and the probability of being a smoker, use alcohol and being drunk during lifetime for boys at age 11.5

	lifetime smoking	lifetime use alcohol	lifetime drunkenness
model 1			
positive self-esteem	0.94 (0.90-0.99) *		
opportunity/refusal smoking	1.26 (1.05-1.51) *		
opportunity/refusal alcohol		1.54 (1.22-1.93) ***	1.33 (1.01-1.75) *
model 2			
self-liking	1.01 (0.90-1.14)	1.03 (0.91-1.16)	0.83 (0.62-1.12)
self-competence	0.98 (0.85-1.11)	0.99 (0.88-1.11)	1.02 (0.77-1.34)
positive self-esteem	0.92 (0.85-1.11) *	0.98 (0.88-1.09	1.45 (1.05-1.99) *
negative self-esteem	0.90 (0.79-1.02)	1.04 (0.96-1.13)	0.95 (0.82-1.11)
self-efficacy general	1.23 (0.97-1.10)	1.00 (0.94-1.07)	1.93 (1.19-3.12)
opportunity/refusal smoking	1.23 (0.96-1.56)		
opportunity/refusal alcohol		1.64 (1.23-2.19) ***	1.93 (1.19-3.12) *
	R^2 = 0.083	R^2 =0.146	R^2 =0.300

*$p < .05$ **$p < .01$ ***$p < .001$

In the multivariate analyses, positive self-esteem was found to be associated with lifetime smoking and drunkenness, opportunity/refusal alcohol was associated with lifetime alcohol use and lifetime drunkenness. A higher level of positive self-esteem was related to a decrease in lifetime smoking and with an increase in lifetime drunkenness. Opportunity and refusal skills were found to be related to an increased lifetime alcohol use and drunkenness.

Table 16 shows the associations between self-system, lifetime smoking, alcohol use and drunkenness with estimated odds ratios (95% confidence intervals) of all the self-system covariates for girls in the sample of early adolescents. In the univariate analyses, self-liking, positive self-esteem, general self-efficacy and smoking were significantly associated with lifetime smoking. Opportunity/refusal alcohol was found to be significantly associated with lifetime alcohol use. Self-liking was significantly associated with lifetime drunkenness. Furthermore, self-liking, positive self-esteem, general self-efficacy were found to decrease the frequency of lifetime smoking and self-liking decreased the probability of lifetime drunkenness. Smoking refusal skills

increased lifetime smoking and opportunity/refusal alcohol increased lifetime alcohol use.

Table 16 The associations between self-system and the probability of being a smoker, use alcohol and being drunk during lifetime for girls at age 11.5

	lifetime smoking	lifetime alcohol	lifetime dr**u**nkeness
model 1			
self-liking	0.91 (83.0.98) *		0.90 (0.81-0.99) *
positive self-esteem	0.94 (0.89_0.04) *		
general self-efficacy	0.93 (0.88-0.98) **		
opportunity/refusal smoking	1.37 (1.05-1.78) *		
opportunity/refusal alcohol		1.32 (1.00-1.74)*	
model 2			
self-liking	1.04 (0.88-1.23)	1.00 (0.87-1.14)	1.01 (0.84-1.22)
self-competence	1.11 (0.95-1.29)	1.10 (0.96-1.26)	1.04 (0.87-1.23)
positive self-esteem	0.96 (0.83-1.10)	0.95 (0.83-1.09)	0.98 (0.82-1.23)
negative self-esteem	0.90 (0.79-1.02)	1.01 (0.81-1.12)	0.98 (0.86-1.10)
general self-efficacy	0.92 (0.83-1.03)	1.06 (0.96-1.16)	0.97 (0.85-1.10
opportunity/refusal smoking	1.62 (1.12-2.35) *	1.28 (0.93-1.77)	1.28 (0.89-1.85)
	R^2 =0.163	R^2 = 0.091	R^2 =0.038

*$p < .05$ **$p < .01$ ***$p < .001$

In the multivariate analyses, only opportunity/refusal smoking was found to be significantly associated with lifetime smoking. Furthermore, opportunity/refusal smoking increased lifetime smoking among girls.

Descriptive analyses revealed (Table 17) significant differences between boys and girls in the middle adolescent sample especially with regard to the aspects of self-esteem: self-concept clarity, self-liking, self-competence, positive and negative self-esteem and social self-efficacy. Boys had significantly higher levels in self-concept clarity, self-liking, self-competence, positive self-esteem and girls had significantly higher level of negative self-esteem.

Table 17 Descriptive statistics for self system and risky behavior by gender at age 14.7

	boys		girls		p
any previous use of cigarettes	99	28.8%	123	33%	0.236
regular use of cigarettes	52	15.1%	47	12.6%	0.321
being drunk during last 4 weeks	119	34.6%	108	29%	0.097
self-concept clarity	38.34	6.37	36.87	6.3	0.020
self-liking	34.27	6.40	32.32	7.02	0.000
self-competence	34.92	6.27	33.52	6.40	0.005
positive self-esteem	14.96	2.49	14.25	2.54	0.000
negative self-esteem	11.74	2.75	12.31	3.02	0.009
general self-efficacy	57.90	8.57	57.18	9.21	0.395
social self-efficacy	19.91	3.39	20.47	3.91	0.100

In Table 18 the correlations between aspects of self-system are shown. All aspects of self-system were found to be correlated significantly with each other. The highest correlation was found between self-liking and self-competence and also between self-liking and positive self-esteem.

Table 18 Correlations matrix for self-system

		1	2	3	4	5	6	7
1	self-concept clarity	1						
2	self-liking	.470**	1					
3	self-competence	.381**	.718**	1				
4	positive self-esteem	.421**	.661**	.579**	1			
5	negative self-esteem	-.472**	-.607**	-.520**	-.520**	1		
6	self-efficacy general	.407**	.453**	.575**	.367**	-.303**	1	
7	self-efficacy social	.210**	.238**	.310**	.212**	-.211**	.353**	1

Table 19 shows associations of self-system with smoking experience, regular smoking and being drunk with estimated odds ratios (95% confidence intervals) of all self-system covariates for boys. In the univariate analyses, self-concept clarity was significantly associated with smoking experience and regular smoking. Negative self-esteem was significantly associated with

smoking experience and general self-efficacy with being drunk. A higher self-concept clarity, and a higher general self-efficacy were found to decrease the probability of these behaviors. Higher level of negative self-esteem increased probability of experience with smoking.

Table 19 The associations between self-system and the probability of being a smoker, regular use of cigarettes and being drunk during the last 4 weeks for boys at age 14.7

	smoking experience	regular smoking	being drunk
model 1			
self-concept clarity	0.94 (0.91-0.98) **	0.94 (0.91-0.98) **	
negative self-esteem	1.11 (1.02-1.22) *		
self-efficacy general			0.96 (0.92-0.99) *
model 2			
self-concept	0.96 (0.90-1.02)	1.00 (0.92-1.10)	0.97 (0.91-1.04)
self-liking	0.93 (0.83-1.03)	1.00 (0.87-1.14)	0.91 (0.82-1.00)
self-competence	1.04 (0.95-1.15	0.9 3(0.82-1.05)	1.07 (0.98-1.18)
positive self-esteem	1.22 (0.98-1.52)	1.35 (1.03-1.78) *	1.15 (0.94-1.40)
negative self-esteem	1.18 (0.98-1.41	1.09 (0.89-1.34)	1.09 (0.92-1.28)
self-efficacy general	0.98 (0.93-1.03)	0.98 (0.91-1.06)	0.96 (0.91-1.01)
self-efficacy social	1.10 (0.98-1.24) *	1.07 (0.91-1.27)	1.03 (0.92-1.15)
	R^2 = 0.144	R^2 = 0.118	R^2 = 0.112

*$p < .05$ **$p < .01$ ***$p < .001$

In the multivariate analyses, positive self-esteem was related to an increased probability of regular smoking and social self-efficacy was related an increased probability of having an experience with smoking.

Table 20 shows the associations of self-system with smoking experience, regular smoking and being drunk with estimated odds rations (95% confidence intervals) of all the self-system covariates for girls in the middle adolescent sample. In the univariate analyses, self-competence was significantly associated with smoking experience, regular smoking and drunkenness. Self-competence was found to decrease the probability of these behaviors. Higher level of social self-efficacy was found to increase regular smoking.

Table 20 The associations between self-system and the probability of being a smoker, regular moking and being drunk during the last 4 weeks for girls at age 14.7.

	smoking experience	regular smoking	being drunk
model 1			
self-competence	0.95 (0.91-0.98) **	0.94 (0.90-0.99) *	0.94 (0.90-0.97) ***
self –efficacy social		1.22 (1.07-1.38) **	
model 2			
self-concept	1.02 (0.96-1.08)	0.99 (0.90-1.110)	0.95 (0.88-1.02)
self-liking	1.01 (0.94-1.09)	0.95 (0.93-1.09)	0.97 (0.88-1.07)
self-competence	0.99 (0.85-1.01)	1.01 (0.87-1.17)	0.97 (0.78-0.97)*
positive self-esteem	0.99 (0.82-1.21)	1.22 (0.85-1.77)	1.14 (0.88-1.48)
negative self-esteem	1.08 (0.93-1.25)	0.97 (0.76-1.22)	0.98 (0.93-1.04)
general self-efficacy	1.01 (0.96-1.05)	0.92 (0.85-0.99) *	0.98 (0.93-1.104)
social self-efficacy	1.06 (0.97-1.15)	1.41 (1.19-1.66) ***	1.26 (1.12-1.41) ***
	R^2 = 0.069	R^2 = 0.238	R^2 = 0.208

*$p < .05$ **$p < .01$ ***$p < .001$

In the multivariate analyses, self-competence was associated only with drunkenness. Higher level of self-competence was found to decrease drunkenness. General self-efficacy was found to decrease the probability of regular smoking. Social self-efficacy was associated with regular smoking and drunkenness.

Discussion

The aim of this research was to examine the relationship between self-system (self-concept: self-concept clarity, dimensions of self-esteem: self-liking, self-competence, negative self-esteem, positive self-esteem, aspects of self-efficacy: general, social, smoking and opportunity/refusal alcohol) and legal drugs (alcohol use and smoking cigarettes) among adolescents (men in early and middle adolescence).

The presented exploration allowed to investigate changes in self-system with regard to age and gender on relatively unique samples of early and middle adolescent students.

In the early adolescent group, there were no significant differences between boys and girls in self-system and its individual aspects: self-liking, self-competence, positive and negative self-esteem and self-efficacy. The boys showed higher mean scores in the dimensions of self-liking, self-competence,

positive self-esteem and the girls showed higher mean scores in describing the negative self-esteem and general self-efficacy but these differences were not significant.

However, in the middle adolescent sample the aspects of self-system significantly differed between boys and girls. Boys hada significantly higher level of self-concept clarity, self-liking, self-competence, positive self-esteem and significantly lower negative self-esteem than girls. With respect to social and general self-efficacy boys and girls did not differ significantly, although higher mean in general self-efficacy was observed in boys and higher social self-efficacy among girls.

The results obtained in the presented explorations are in line with the findings obtained in other studies. For example, Baldwin and Hoffmann (2002) also reported changes in self-system (self-concept and self-esteem) among girls and boys. These intrapersonal changes were observed in a 7 year longitudinal study among students. The results showed that at the age of 11, girls reported insignificantly higher self-esteem and self–concept when compared with boys. Girls' self-esteem was found to decrease between the age 12 to about the age of 17. Boys' self-esteem was found to increase until the age of 14 then showed a decreasing tendency to about 16 and then started to increase until the early adulthood. The first decrease in self-esteem among girls was associated with the scheme of the body and sensitivity to stress. In boys, it was found to be related to the loss of social relationships due to the transition from primary to secondary school. In older adolescence, Blatný (2010) assumes a lower level of all aspects of self-system in girls.

The changes in self-system often co-occur with the first experience in risk behaviors. They are most commonly represented by the use of legal drugs such as cigarette smoking which is often seen as part of “growing up”. The summary results of the five waves of surveys TAD (tobacco, alcohol, drugs 1994-2012), aimed at primary school pupils and secondary school students and their teachers, showed that despite the numerous programs and projects these efforts fail to influence the occurrence and the extent of the first experience with alcohol between 11-14 years and it continues to grow steadily. The average age of the first experience is about 10 years the efforts are failing to delay it.

In our sample of early adolescent pupils significant differences between boys and girls in lifetime prevalence of smoking and lifetime prevalence of alcohol use were found. In both cases, boys reported higher frequency in having an experience with smoking (14% boys, 8.2% girls) and drinking (23.85% boys and 13% girls). It seems that alcohol is an important legal drug in the life of adolescents. However, the differences in the variable measuring the number of times of "being drunk throughout life" were not significant.

In the middle adolescent 28.8% of boys and 33% girls group never tried cigarettes. Regularly smoked 15.1% of boys and 12.6% girls. With regard to being drunk 34.6% of boys and 29% girls reported being drunk during the last four weeks. The reported information by boys and girls with regard to the use of alcohol, drunkenness, as well as regular smoking did not differ statistically.

Interrelationships between self-concept clarity, self-esteem (self-liking, self-competence, positive and negative self-esteem), self-efficacy (social, general, refusal skills) were studied using correlation analysis. In the early adolescent sample, positive correlations between self-liking positive self-esteem and negative correlation between negative self-esteem and self-competence were observed. Smoking refusal sills were found to be correlated only with opportunity/refusal alcohol. In the middle adolescent sample, individual aspects of self-system correlated significantly with each other. The highest correlation was found between self-liking and self-competence and a high correlation was also found between self-liking and positive self-esteem.

In the empirical investigations of this chapter, significant relations were found between all components of self-concept and the use of legal drugs. Higher self-concept clarity was found to decrease the probability of having experience with smoking and being a regular smoker (boys, middle adolescent sample); higher self-liking was found to decrease the frequency of lifetime smoking and lifetime drunkenness (girls, early adolescent sample); higher self-competence was found to decrease the probability of smoking experience, regular smoking, and being drunk (girls, middle adolescence); higher positive self-esteem was found to decrease the frequency of lifetime smoking and of lifetime drunkenness (girl, early adolescent sample), decreased lifetime smoking, increased lifetime drunkenness (boys early adolescent sample), and increased probability of regular smoking

(boys middle adolescent sample); a higher level of negative self-esteem was found to increase the probability of having experience with smoking (boys middle adolescent sample); higher level of general self-efficacy was found to decrease the probability of being drunk (boys, middle adolescent sample), decreased the frequency of lifetime smoking (girls, early adolescent sample), and decreased the probability of regular smoking (girls, middle adolescent sample); higher social self-efficacy was found to increase the probability having experience with smoking (boys, middle adolescent sample), and increased regular smoking and being drunk (girls, middle adolescent sample); opportunity/refusal smoking, increased smoking (boys, early adolescent sample), alcohol refusal skills increased lifetime use alcohol and drunkenness (boys, early adolescent sample), smoking refusal skills increased lifetime smoking (girls 11, 5), opportunity/refusal alcohol increased the lifetime use of alcohol (girls, early adolescent sample).

Campbell, Assababd and Paula (2003) found that self-concept clarity understood as a marker of self-concept unity had a moderate positive association with self-esteem and a moderate negative correlation with neuroticism. Similarly, the results of Cicei (2012) indicate that there is a strong correlation between the self-esteem and self-concept clarity constructs. The male students obtained stronger correlation levels than the female students. Guadagno and Burger (2007) suggest that people with a clear, well-articulated self-concept are more likely to rely on self-information to guide their behavior than those low in this personality dimension. Latent Growth Curve analyses indicated that adolescent boys reported higher self-concept clarity than girls (Crocetti et al., 2015).

Self-esteem should be examined not only as a cause but also as a consequence of risk behavior (Mann, Hosman, Schaalma et al., 2004). The relationship between self-esteem and health related behavior is complicated due to the fact that this relationship may be mediated by other variables. Moreover, the role of certain aspects of self-esteem, such as negative self-esteem, may be more easily understood than others. For example, a high level of negative self-esteem was found to increase the likelihood of prevalence of risk behavior in our investigations which can be also seen in other studies (Kim, 2011). On the other hand, positive self-esteem is mediated through motives and if it is too high it can lead to aggression and take the narcissistic slope. In this case, it

can be related to risk behavior as pointed out in the study by Baumeister et al. (2003). Contrary, positive and healthy self-esteem is usually negatively associated with risk behavior. These results also support our findings with regard to the fact that high positive self-esteem decreases the frequency of lifetime smoking in early adolescent girls and boys but increases the probability of being drunk (boys, early adolescent sample) and regular smoking (boys, middle adolescent sample). Finally, a higher level of negative self-esteem was found to increase the probability of having experience with smoking (boys middle adolescent sample).

The dimensions self-liking and self-competence are less explored sources of self-esteem (Lee-Flynn et al., 2011). They constituted important variables in our investigation were found to be related the use of cigarettes and alcohol of in girls (both early and middle adolescent samples). In both cases, a higher level was associated with a lower incidence of the given behavior. These findings are particularly interesting in the context of the short period which takes place at approximately at 11 when self-liking and self-competence of girls is similar to boys' and at 14 when again both dimensions of self-esteem tend to be higher in boys.

This makes it possible to explore the role of individual dimensions of self-esteem along with social self-efficacy in relation to risk behavior. In many cases, these variables have been found to serve the role of risk factors which was also found in our exploration in the sample of middle adolescent boys and in girls (higher social self-efficacy increased probability of having experience with smoking, and regular smoking increased the probability of having been being drunk). Perceived efficacy in social situations and in relations was found to increase the likelihood of engaging in health-related behaviors. Peer groups and social environment provide interpersonal context for initiation and continuation of health-related behaviors, hence the risk as normative, acceptable behavior, while increasing the opportunity and exposure to experiential learning from older people (Rivis, Sheeran, Armitage, 2011). The fact that social self-efficacy increases the likelihood of risky behavior is consistent with other studies (Prestwich et al, 2013).

General self-efficacy in girls as well as boys reduced the prevalence of legal drugs. Higher level of general self-efficacy decreased the probability of being drunk (boys, middle adolescent

sample), decreased frequency of lifetime smoking (girls, early adolescent sample), and decreased probability of regular smoking (girls, middle adolescent sample), similarly to other studies (Choi, Krieger, Hecht, 2013; Prestwich at al., 2013).

An interesting area of investigation was the exploration of alcohol and opportunity/refusal smoking (Choi, Krieger, Hecht, 2013). For both genders in the early adolescent sample, smoking and opportunity/refusal alcohol were found to be related to the corresponding behavior, which can be a useful concept for prevention policy in public health.

FUTURE RESEARCH

In the explorations presented in this chapter, the relationships of the intra-individual characteristic self-system and the use of legal drugs were explored. However, it must be said that there are additional intra-individual characteristics such as attitudes, intentions and motivation, normative beliefs, incongruence and resilience, which similarly to self-system play a crucial role in relation to the use of legal drugs. Furthermore, motivation, autonomy, authenticity and stress are likely to be the mediators between intrapersonal variable and drug use. Also interpersonal and cultural variables such as peer pressure, parental monitoring, accessibility of legal drugs are additional important as moderators as well as directly related to legal drug use. These variables can be incorporated in future research.

LIMITATION

The design of the study was cross sectional but next data collection allowing for longitudinal analyses.

IMPLICATION FOR PRACTICE

The general importance of early primary prevention in early adolescence concerning the experiences with legal drugs for juveniles needs to be stressed. In this age group, about half of the students were found not to have any experience with alcohol or cigarettes. The average age of the first experience with alcohol and smoking cigarettes is about 10 years. The attempts to delay this seem to fail. The first experience with legal drugs is with alcohol which is usually available at home. The prevalence alcohol and smoking cigarettes is higher among boys than girls in early adolescence but during the middle adolescence the prevalence of drug experiences between genders becomes even. Tobacco use has a tendency to become stable but alcohol continues to show increased prevalence in even the most risky patterns of drinking (binge drinking – drinking as quickly as possible in order to get drunk). In girls drinking alcohol has recently risen much faster and more teenage girls in several

respects reach the level of teenage boys and young men. Self-system of girls is more sensitive to drug experience. The resilience model (Zimmerman, 2013) posits that individual factors may reduce sensitivity to adverse environmental factors, such as alcohol and cigarette accessibility. These results are consistent with previous research regarding alcohol and cigarette use and protective mechanisms of young adolescents (Ehret, Ghaidarov, LaBrie, 2013).

Conclusions

This chapter presents the findings regarding the relationship between self-system (self-concept clarity, self-esteem: self-liking, self-competence, positive and negative self-esteem, self-efficacy, general, social, refusal skills) and legal drugs (experience with smoking cigarettes, regular smoking, lifetime smoking, total number of times being drunk in life time, being drunk during the last 4 weeks) in two age periods the early and middle adolescence. Legal drug use increases with age and with increasing age of participants the initial gender differences diminish. While there are few differences in self-system in the early adolescence difference seem become more significant during the middle adolescence in disadvantage for girls. In the presented investigations significant role of all surveyed variables in explaining the use of legal drugs was found: self-concept clarity self-liking and self-competence and general self-efficacy were negatively related to legal drugs. Social self-efficacy, and negative self-esteem, were positively associated with legal drugs. Positive self-esteem was positively and also negatively associated with legal drugs among boys, among girls it produced negative associations with legal drugs. This exploration supports the importance of the specific aspects of self-system regarding consumption of legal drugs with respect to gender and age differences.

Alcohol use, smoking and early sexual intercourse in light of different parenting styles

Introduction

Health-related behavior

The period of adolescence is characterized by significant physical, emotional and cognitive changes which may represent dramatic challenges for young boys and girls. During this developmental period a number of health-related behaviors occur and may affect actual health or health status in later years. Behaviors such as alcohol use, tobacco use, use of other drugs and sexual behavior can lead to a full range of health difficulties (e.g. adolescent pregnancy; sexually transmitted diseases; eating disorders; depression) and social difficulties as well (e.g. learning troubles; family problems; poverty). These health issues, most of which are preventable, can lead to significant morbidity and even mortality. In this chapter, we will focus on three major types of behavior: alcohol use, smoking and early sexual intercourse. All of these have been shown to be associated with health problems and will be identified as a health-risk behaviors in this chapter.

Family environment

Family environment is a multidimensional construct consisting of heterogeneous psychological and social factors (DiClemente et al., 2001). Most of the authors have defined healthy family environment by effective communication, creativity, clear and accepted roles and problem-solving strategies. Moreover, family cohesion, adaptability and stability in reciprocal interaction are the factors which provide autonomy, personal responsibility, independence in thinking and evaluation as well as feeling of emotional closeness and mutuality to each member of the family (Sulova, 1998).

The family system and its influences on adolescent health-risk behavior can be divided into two major categories: the family structure factors (single parenting, socioeconomic status, parental education) and the process factors (parental control or monitoring, bonding, closeness and communication in a parent-

child relationship). In general, the process variables have received more attention than the family structure category (Kotchick, Shaffer, Forehand, 2001). However, there is evidence that structural factors, such as single parenting, socioeconomic status (SES), and parenting education, should not be ignored.

As suggested by Dishion and McMahon (1998) parental influence on adolescent behavior is multifaceted so exploring a broader set of variables which impact this behavior seems to be a more effective approach than focusing on a single construct. For example, the quality of a parent-child communication has been found to be the crucial factor regarding effective parental attitudes towards health-risk of their own children. However, when parenting strategies are explored in relation to health risk-taking behaviors in adolescence, e.g. sexual behavior or alcohol use, studies are often limited to only few factors, and most often, only to the role of parental monitoring. The other possible factors (e.g., behavior management, social cognitions, parental trust, parental support) have been considered much less frequently (de Graaf, Vanwesenbeeck, Woertman, et al., 2011).

Theoretical approaches studying health risk behavior such as sexual risk behavior and alcohol use among adolescents have focused on several crucial issues and causes (DiClemente et al., 2001; Goodson, Buhi, 2007). Many authors have reported that parent-child interactions are a major factor for shaping adolescents' attitudes and peer contexts, what may later serve as a pattern through which family contexts function (Coley Votruba-Drzal, Schindler, 2008; Whitbeck, Yoder, et al., 1999).

The theories regarding family processes are focused on the importance and quality of relationships and behaviors inside a family as part of a bidirectional influential system (Cox, Paley, 1997). Social control and attachment styles of parenting provide insight into how the family environment may affect adolescents' health risk behavior in different ways. In the period of adolescence, time spent outside the family increases and parental distal behavior (e.g. monitoring) may prevent health-risk choices of adolescents (Gray & Steinberg, 1999). Parents also provide structural contexts for children through the resources which they provide (e.g., marital status, family members, affluence). However, the path of influence is unlikely to be unidirectional as mothers and fathers react to the behavior of their children as well (Crouter, Booth, 2003). These reactions, in a reciprocal manner,

may further shape the following behavior of the children. During periods when children are confronted with risk behaviors, they disengage from their families and thus parents might become less effective and less involved and more negative which may increase the opportunities for children's health risk behavior. The theories of the relatedness of problem behaviors (Costa, Jessor, Donovan et al., 1995) however, propose that adolescents' risk behaviors might show similar bi-directional relationships with parenting practices and family relationships. In conclusion, recent transactional models propose that risk behavior of adolescents is perceived by parents as well therefore their parenting styles could be less involved and effective what in turn escalate health-risk behavior (Coley, Votruba-Drzal, Schindler, 2008).

Role of family structure

Children living in incomplete families are more likely to face developmental disturbances including health risk behavior. Regarding sexual risk behavior studies on family structure indicate that living in complete families is protective against SRB (Metzler, Noell, Biglan, et al., 1994). This was supported in a study by Klavs et al. (2005) in which the main factor associated with early start with sexual life was not living with both parents. Moreover, a study by Devine, Long and Forehand (1993) indicated that parental divorce in early adolescence was significantly associated with girls' sexual risk behavior in later adolescence. According to some other studies, family structure may influence other types of health risk behavior as well. A study among Slovak young adolescents found that adolescents from divorced families are more likely to drink to get drunk than their peers. Moreover, divorce was a stronger predictor of alcohol abuse than other factors such as low parental support and poor socioeconomic position (Tomčiková, Gecková, Orosová et al., 2009).

In the context of alcohol use, many studies (Kuntsche, Kuending, 2006; Fisher et al., 2007) have reported that a single-parent family could represent a risk factor. Decreased parental control in single-parent families, lower socio-economic status or immediate consequences of divorce on adolescents (e.g. increased levels of depression and anxiety), might represent the pathways which can explain such behavior. The increasing divorce rate in Slovakia (41% of divorced marriages in 2003 compared with 32% in 1995) emphasizes the great public health implications of this issue (Mladek, Kusendova, Marencakova et al., 2006).

Socioeconomic status of family

The socioeconomic status of families seems to play an important role in adolescent sexual risk behavior and alcohol use. Although the findings regarding the direction of this association are not consistent. There are studies which have found an association between low socioeconomic status and a higher likelihood of health-risk behavior in general (Romelsjo, Lundberg, 1996; Andersen, Holstein, Due, 2008). However, the results regarding alcohol use are inconsistent. On one hand, the higher perceived socioeconomic by an adolescent, the higher the levels of the reported alcohol use (Littlejohn, 2006); however, lower levels of parental education (Arvantidou, Tirodimos, Kyriakidis et al., 2007) or low levels of family affluence (Zambon, Lemma, Borraccino et al., 2006) were also associated with increased alcohol use. Differences regarding the pattern of alcohol use can be found as well – while excessive drinking has been found to be associated with being in a lower socioeconomic group, regular, but moderate drinking is more common in higher socioeconomic groups (Romelsjo & Lundberg, 1996). Inconsistent findings have also been seen between genders – the traditional socioeconomic pattern (the lower the socioeconomic position, the higher increase of health-risky behavior) was found among boys, but the reverse pattern was found among girls (Salonna et al., 2008).

Several studies have confirmed the association between low SES and risky sexual behaviors (Capaldi, Stoolmiller, Clark, Kirisci, Mezzich et al., 2002; Myers, Javanbakht, Martinez et al., 2003). Researchers have consistently found that parental employment and higher educational levels are positively associated with higher levels of safe sex practices (Roosa, Tein, Reinholz et al., 1997; De Graaf, Vanwesenbeeck, Woertman et al., 2011). Higher education of the mother has been found to be associated with a significant delay of the first intercourse and contraceptive use among youths (Brewster, 1994; Cooksey, Rindfuss, Guilkey, 1996). Parents' education indicates access to financial resources, information, and more liberal attitudes toward sex behavior. Well-educated parents are also more likely to get involved in their children's school activities and in their sex education process (Cooksey, Rindfuss, Guilkey, 1996). Moreover, such parents were found to have higher career aspirations for their children what in turn may delay sex initiation, pregnancy, and tended to be more protective against sexually transmitted diseases. Furthermore, family class indirectly affects sex behavior

through the place of residence. It influences, along with race, youth's neighborhood of residence through residential segregation and preferences (Aneshensel, Sucoff, 1996).

Parenting styles

Parenting practices represent a set of interrelated factors including but not limited to parental monitoring, parental support, communication, and involvement (Bersamin et al., 2008). The influence of parents on adolescent behavior is multifaceted and cannot be explored and understood by focusing on one construct only (Dishion, McMahon, 1998). The associations between parenting styles and sexual behavior have been shown in a number of studies (e.g. Bersamin et al., 2008; Borawski et al., 2003; De Graaf, Vanwesenbeeck, Woertman et al., 2011). In this context, parental monitoring and parental support are the two most studied aspects of parental processes associated with sexual risk behavior of adolescents. Parental support can be characterized by warmth, responsiveness and child-centeredness. Monitoring is usually defined as parental behavior characterized by active supervision of their child's whereabouts. According to previous studies there are indications that a high level of parental monitoring and support are associated with: (1) later age first sexual onset (Bersamin et al., 2008); (2) consistent contraceptive use (De Graaf et al., 2010); (3) more consistent condom use (Huebner, Howell, 2003); (4) lower levels of STIs (Crosby, DiClemente, Wingood, et al., 2002).

In the context of adolescent drinking, some studies have indicated that a lower parental support is associated with a higher risk of alcohol use among adolescents (Shucksmith, Glendinng, Hendry, 1997; Windle, Miller-Tutzauer, 1997) though not all studies have confirmed this association (Lifrak, McKay, Rostain et al., 1997). Moreover, other studies have found that the adolescents who perceive low monitoring by their parents are more likely to be involved in alcohol use (Beck, Boyle, Boekeloo, 2004).

Parental monitoring

Parental monitoring is characterized as an active parental supervision of child’s whereabouts, activities and friends (Jacobson, Crockett, 2000) through which the parents and family facilitate the adjustment of adolescents, by providing supervision

and guidance (Smetana, Daddis, 2002). Parental control may serve as a protective factor also in situations when adolescent is directly exposed to risk factors outside the family (school environment, peers, going out with friends, etc.) (Nash, McQueen, Bray, 2005). However, recent approaches see parental monitoring more as a matter of mutual communication between parents and adolescents than a matter of direct observation (Clark, Kirisci, Mezzich et al., 2008). Therefore, the effectiveness of parental monitoring might be dependent on the quality of parent-adolescent communication. The issue that puts parental monitoring into specific position is adolescents' higher need for autonomy and independence and the fact that they spend more time outside their parental home in comparison to previous years (Loukas, Prelow, 2004).

Parental monitoring redefined as parental knowledge

Recently, Stattin and Kerr (2000) proposed an alternative definition of monitoring. They argue that parental monitoring measures have actually been measuring parental knowledge of the adolescent activity, rather than parental tracking and supervision efforts. Stattin and Kerr propose that this knowledge depends on an adolescent's willingness to disclose information to parents. In a series of self-report studies, their questionnaires found that three factors were important to parental monitoring knowledge: child disclosure (children spontaneously telling parents what they have been doing); parental solicitation (parents asking children what they have been doing); and parental control (rules and limit setting). This research found that the most important contributor to parental monitoring knowledge was child disclosure. The parental solicitation was associated with higher, not lower, problem behavior. Therefore, Stattin and Kerr (2000) called for a reinterpretation of parental monitoring as parental knowledge, and this rests on an understanding of the factors that determine child disclosure, not parental activity.

Nevertheless, most of these studies explored parental monitoring and parental support without differentiation between the mother and father and those two parental activities were mostly explored as single variables. Therefore, information about which of the parents is more/less likely to influence a child's sexual behavior is rather unclear. Another poorly explored issue are the differences in perception of parental processes parents and by the

child as the parental perception of own parenting may significantly differ from their child.

Parental support (warmth, communication, activity engagement)

Parental monitoring parent–child bonding and engagement in joint activities have been found as important factors in understanding youth risk behaviors. Joint activities with positive mutual outputs may support parental opportunities for positive and communicative relationships. Such relationships, in turn, may serve as a pattern through which parents place their views and shape young people in developing decision skills in the context of health-risky choices (Fiese et al., 2002; Sieverding, Adler, Witt et al., 2005). On the other hand, adolescents with unsupervised time or hostile relations may initiate the influence of peers or social norms from other sources (e.g., media). However, recent results have shown parental hostility or warmth and adolescent risk behavior are rather inconsistent (Coley, Medeiros, Schindler, 2008; Ream, Savin-Williams, 2005). However, a few studies have confirmed the protective effect of joint activities between parents and children (Coley, Votruba-Drzal, Schindler, 2008; Ream, Savin-Williams, 2005).

Another important issue of family functioning is the quality of communication between parents and their children, which has been identified as an important protective factor (Currie et al., 2008). This accounts particularly for the adolescent period where parent-child communication is on the decrease and therefore the communication becomes generally more difficult. Effective parent-child communication may indicate social support from parents and higher family connectedness (Laursen, 1995) while poor parent-child communication has been found to be associated with a higher risk of adolescence substance use (Currie et al., 2008). Regarding the perception of communication quality, there are some discrepancies as adolescents usually perceive it to be less open and more problematic than their parents do (Wilson, 2004). Mothers in contrast to fathers perceive communication with adolescent children more positively (Rosnati, Iafrate, Scabini, 2007). This also counts in a reciprocal manner as communication with the mother was perceived as easier than with the father for boys and girls (Rosnati, Iafrate, Scabini, 2007). However, a study by Ackard, Neumark-Sztainer, Story et al. (2006)

demonstrated that girls more than boys felt uncomfortable talking about their problems to the father, whereas boys and girls felt equally comfortable talking to their mother. As a result, it might be hypothesised that communication with the father and with the mother may play different aspects in the substance use of among adolescents (Luk, Farhat, Iannotti et al., 2010) as the association between the quality of mutual communication and substance use outcomes seems to be stronger in females (Choquet et al., 2008).

Aim

The general purpose of this study was to contribute to this ongoing debate by exploring in greater detail the links among parenting (control, closeness), knowledge and three different types of risk behavior (alcohol, smoking and sexual experience). The first aim was to examine the role of parenting styles in predicting the amount of parental knowledge. Secondly it was aimed to compare two different models that examine whether control and closeness through knowledge predict health-risky behavior.

Sample

The second study sample examined 3,725 elementary school adolescents in the 8th and 9th grades from primary schools from three cities – Bratislava (600,000 inhabitants; Western Slovakia), Zilina (156,000 inhabitants, Northern Slovakia), Kosice (240,000 inhabitants, Eastern Slovakia) as well as other smaller cities (10,000-40,000 inhabitants) in the eastern region of Slovakia. The schools and classes were selected randomly in each region. The headteachers were asked for participation. After their consent and the consent of their parents, data were collected by a team of trained researchers and research assistants in October, November and December 2006. Respondents filled in a questionnaire on a voluntary and anonymous basis without the presence of the teacher during two regular 45-minutes lessons. The overall response rate was 93%. Non-response was primarily due to illness or another type of absence. The sample consisted of 49% boys, with a mean age of 14.3 years (SD 0.65; range 11-17 years). All respondents younger than 13 and older than 16 years old were excluded in order to make the sample more homogenous and to avoid age extremes which could have an impact on the results. After this exclusion, the final study sample consisted of 3,530 adolescents (mean age 14.3 years, SD 0.62). The local Ethics Committee approved the study. The questionnaires were administered in Slovak on a voluntary basis, without identifying data. We did not gather any information about names or

addresses, and pupils could opt out anytime. This was explained to them verbally and was also described in the introduction to the questionnaire.

Measures

Alcohol use was measured by the number of alcoholic drinks (one glass of wine, beer or spirit) during a typical week. Pupils were asked to indicate the number of drinks per day in a week on a four point scale (none; one; 2-3; 4 and more). The final output variable was created by computing the reported numbers of drinks from each day. Higher scores indicate a higher number of alcohol drinks per week.

Smoking was measured by the number cigarettes used in a typical week. Students were asked to indicate the number of smoked cigarettes per day in a week on six point scale (none; one; 2-5; 6-10; 11-15; 16 and more). The final output variable was created by computing the reported numbers of cigarettes from each day. Higher scores indicate a higher number of cigarettes per week.

Sexual behavior was measured by the single question whether respondents had ever had sex (no/ yes).

Parental processes. All three explored parental processes were measured by the Adolescent Family Process Measure (Vazsonyi, Hibbert, Snider, 2003), which is a 25-item self-reported questionnaire assessing six dimensions of family processes (closeness, support, monitoring, communication, conflict and approval) separately for mother and father. For the purpose of this study, only the dimensions of closeness and monitoring were used. Using principal component analyses (PCA), the dimension of monitoring was found to score two independent factors – parental closeness and parental knowledge. A detailed description of this process is in the statistical section of this manuscript. The dimension of closeness was scored by four items on a five-point Likert-type format scale from strongly disagree (1) to strongly agree (5). Scores ranged from 4 to 20, with higher scores indicating a higher level of closeness (Cronbach's Alpha =.724). The dimension of parental control were scored by two questions on the same five-point Likert-type scale with higher scores indicating a higher level of control (Cronbach's Alpha =.690). The dimension of parental knowledge was measured by two question on the same five point scale with higher scores indicating a higher level of knowledge (Cronbach's Alpha

=.745). All variables were used as continuous in further analyses.

STATISTICAL ANALYSES

First, a factor analysis was performed on the Adolescent Family Process Measure to examine whether the dimension of monitoring might be a construct of two independent dimensions – control and knowledge. For this purpose, a principal component factor analysis (PCA) was performed on the two dimensions of Adolescent Family Process Measure (monitoring - 4 items and closeness – 6 items). The study omitted variables with Kaiser-Meyer-Olkin (KMO) statistics lower than 0.6 or with communalities lower than 0.4 (McCallum, Peterson, 2012), leading to the elimination of two items. The resulting KMO measure of sampling adequacy was 0.748, highly above the recommended value of 0.6. Moreover, Bartlett's Test of Sphericity was significant on p<.000 and the diagonals of the anti-image correlation matrix were all over 0.46, supporting the inclusion of each item in the factor analysis. Then three factors were extracted with loadings from 0.666 to 0.863.

To verify and confirm the factor structure of the model structural equation modelling was used. The model fit was evaluated in terms of chi-square, root mean square residuals (RMR), and various goodness of fit indices. The goodness of fit for the model was ÷2=230.749 (34, p=<.001). ÷2/df=6,787, RMR=.044, GFI=.983, CFI=.968, RMSEA=.042. Although the ÷2 was significant, the other indexes showed that the model still fitted very well. Thus, it is possible to say that both models describe the data very well. The reason for this undesirable ÷2 significance is the large sample size (N=3530).

Then the gender differences were examined in the output variables (Table 21) and parental processes by using T-tests and chi-square test (Table 22).

Table 21 Three types of risky behavior comparison by gender

	boys		girls		
	mean	SD	mean	SD	p
number of drinks	9.5	4.2	9.1	3.6	0.001
smoking	10.5	7.8	10.1	6.9	0.196
	n	%	n	%	
ever had sex - yes	234	15.2	146	8.7	0.000

Table 22 Comparison of perceived parental processes by gender

	boys		girls		
	mean	SD	mean	SD	p
parental control					
mother	10.47	2.89	11.03	2.72	0.000
father	9.44	2.86	9.48	2.93	
parental closeness					
mother	22.40	3.87	22.98	4.09	
father	21.44	4.09	21.33	4.4	
parental knowledge					
mother	6.06	2.17	6.76	2.06	
father	5.55	2.07	5.75	2.14	

Finally, multiple regression analyses were performed by using a PROCESS procedure for SPSS (Hayes, 2012) to examine whether the relationship between the independent variables (closeness, control) and dependent variables (alcohol use, smoking, sexual experience) is mediated through parental knowledge (mediator). For this purpose, there were three models (one for each behavior) separately for the mother and father parental processes. These analyses were controlled for gender as a covariate. The indirect effects were tested using the bootstrapping method with bias-corrected confidence estimates (C.I.=.99%; 5000 bootstrap samples).

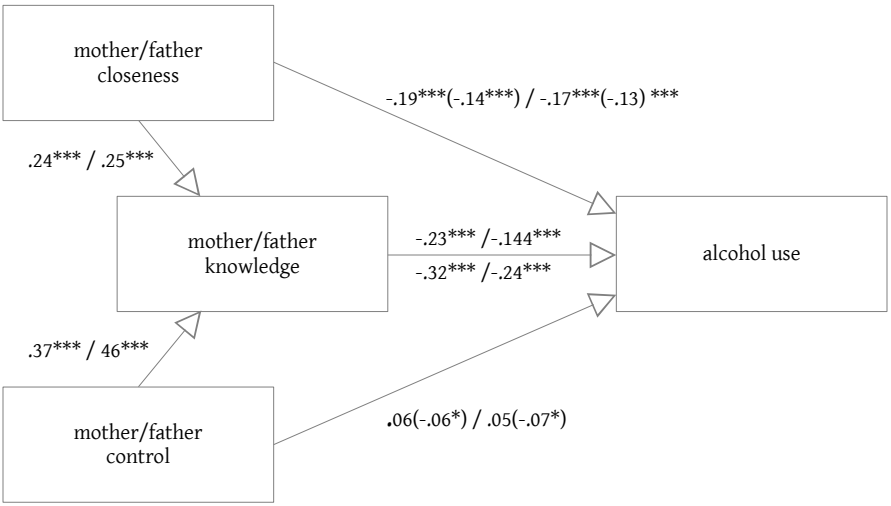
Results

Alcohol use and parental control mediated through parental knowledge

Multiple regression analyses were used to assess each component of the proposed mediation model. First it was found that perceived maternal control was negatively associated with AU (B=-.06; t=-1.95, p=.05). It was also found that perceived maternal control was positively associated with perceived maternal knowledge (B=.37; t=22.75, p=.001). Next, maternal knowledge was found to be negatively associated with AU (B=-.32; t=-8.66; p=-.001). Indirect analyses confirmed the mediating role of maternal knowledge on the relationship between maternal control and AU (B=-.12; CI=-.16 to -.08). Finally, the results indicate the full mediation process as a direct effect of maternal

control was non-significant after controlling for knowledge (B= 0.06; t=1.59; p= 0.11). Very similar results were confirmed also among paternal control, knowledge and alcohol use (Figure 13).

Figure 13 Mediation model predicting relationship among parenting styles, parental knowledge and alcohol use



Alcohol use and parental closeness mediated through parental knowledge

It was found that perceived maternal closeness was negatively associated with AU (B=-.19; t=-8.11, p=.001). It was also found that perceived maternal closeness was positively associated with perceived maternal knowledge (B=.24; t=19.40, p=.001). Next, maternal knowledge was negatively associated with AU (B=-.23; t=-6.38; p=.001). Indirect analyses confirmed the mediating role of maternal knowledge on the relationship between maternal closeness and AU (B=-.054; CI=-.08 to -.03). Finally, the results indicated the partial mediation process as a direct effect of maternal closeness was less significant after controlling for knowledge (B=-.14; t=-5.49; p=0.001). Very similar results were confirmed also among paternal closeness, knowledge and alcohol use (Figure 13).

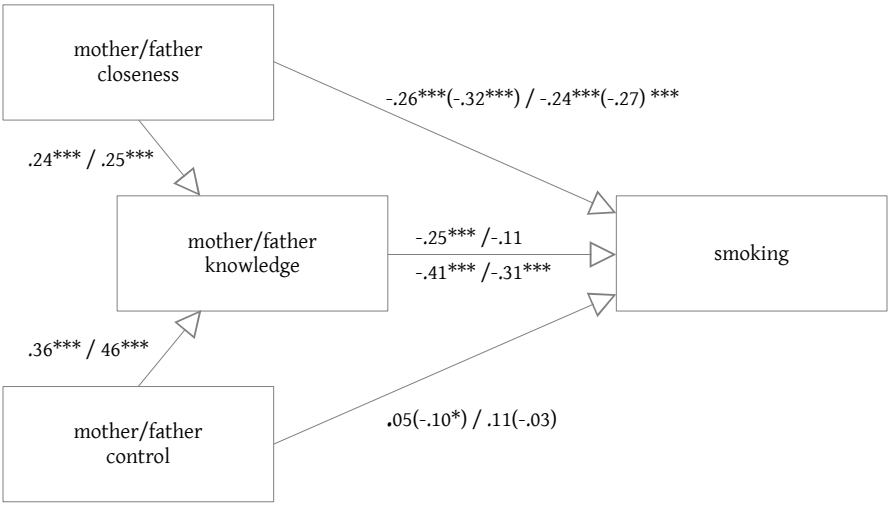
Smoking and parental control mediated through parental knowledge

It was found that perceived maternal control was not significantly associated with SM (B=-.10; t=-1.64, p=.10). However, it was also found that perceived maternal control was positively associated with perceived maternal knowledge (B=.36; t=22.32, p=.001). Next, maternal knowledge was negatively associated with smoking (B=-.41; t=-6.00; p=.001). Indirect analyses confirmed the mediating role of maternal knowledge on the relationship between maternal control and AU (B=-.15; CI=-.22 to -.07). Finally, the results indicate the partial mediation process as a direct effect of maternal closeness was less significant after controlling for knowledge (B=.05; t=0.73; p=.47). Very similar results were also confirmed among paternal control, knowledge and smoking (Figure 14).

Smoking and parental closeness mediated through parental knowledge

It was found that perceived maternal closeness was negatively associated with AU (B=-.32; t=-7.40, p=.001). It was also found that perceived maternal closeness was positively associated with perceived maternal knowledge (B=.24; t=19.50, p=.001). Next, maternal knowledge was negatively associated with AU (B=-.25; t=-3.80; p=.001). Indirect analyses confirmed the mediating role of maternal knowledge on the relationship between maternal closeness and AU (B=-.06; CI=-.11 to-.01). Finally, the results indicate the partial mediation process as a direct effect of maternal closeness was less significant after controlling for knowledge (B=-.26; t=-5.60; p= 0.001). Such results did not account for paternal processes as paternal knowledge was not associated with smoking and thus no mediation effect was found (Figure 14).

Figure 14 Mediation model predicting relationship among parenting styles, parental knowledge and smoking



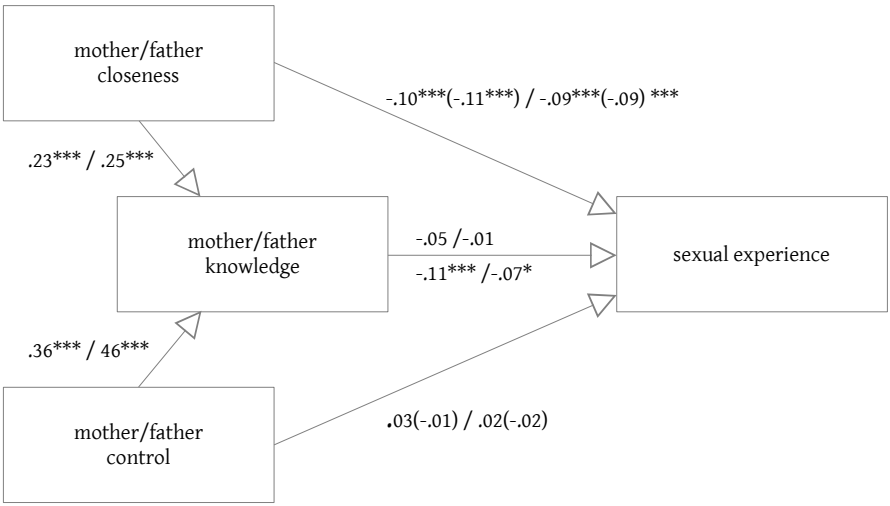
Sexual experience and parental control mediated through parental knowledge

It was found that perceived maternal control was not significantly associated with SE (B=-.01, t=-.38, p=.75). However, it was also found that perceived maternal control was positively associated with perceived maternal knowledge (B=.36; t=22.32, p=.001). Next, maternal knowledge was negatively associated with smoking (B=-.11; t=-4.00; p=.001). Indirect analyses confirmed the mediating role of maternal knowledge on the relationship between maternal control and SE (B=-.04; CI=-.07 to -.01). Finally, the results indicate the mediation process as a direct effect of maternal control was more significant after controlling for knowledge and has a different sign than total effect (B=.03; t=1.20; p=.23). Very similar results were also confirmed among paternal control, knowledge and sexual experience (Figure 15).

Sexual experience and parental closeness mediated trough parental knowledge

It was found that perceived maternal closeness was negatively associated with SE (B=-.11; t=-7.40, p=.001). It was also found that perceived maternal closeness was positively associated with perceived maternal knowledge (B=.23; t=20.60, p=.001). However, maternal knowledge was not associated with SE (B=-.05; t=-1.67; p=.09). Therefore, indirect analyses confirmed no mediating role of maternal knowledge on the relationship between maternal closeness and AU (B=-.01; CI=-.03 to .01). Very similar results were also confirmed among paternal closeness, knowledge and sexual experience (Figure 15).

Figure 15 Mediation model predicting relationship among parenting styles, parental knowledge and sexual experience



Discussion

This study was conducted with the aim of comparing two different parental styles which were frequently identified as protective in health risk behavior. The design of this study was also driven by an ongoing literature debate on the question of whether parents play an active or rather minimal role in reducing

the health-risky behavior of their children. Parental control in this current study represented the active and more directive parental style. On the other hand, the perceived parental closeness represented mutual processes driven by parents and children. In both described processes, it was expected that the active role of parental knowledge would be a potential mediator of the relationship among parental styles and risk-taking behavior.

The results indicate that parental control and parental closeness may differ with regard to the type of health risk behavior. Regarding alcohol use, parental control predicted fewer drinks but the indirect effect control (mediated through knowledge) was much stronger. This suggests that parental control – a process which is solely driven by parents, may reduce alcohol use in both ways, but parental control without relevant information is much less effective. These results also confirmed the amount of parental knowledge as a key factor in the context of parenting styles.

Slightly different results were found regarding smoking and parenting control. In this risk behavior, parental control was not directly (unmediated) associated with smoking (contrary to AU). However, when the relationship between control and smoking was mediated (through knowledge) the significance of control was confirmed which suggests that controlling parents are effective in getting information which in turn may reduce smoking.

Regarding sexual experience, similar results were found. Higher control did not predict later sexual intercourse but when the relationship was mediated (through knowledge) the significance of control was confirmed.

In all three types of risk behavior, a similar process can be seen. Parental control – driven from the mother or father is not associated with risk behavior (only in AU but the p values lie on the edge of significance). These results may support previous findings (Kakihara, Tilton-Weaver, Kerr et al., 2010) which doubt control as a parental protective activity. However, our results suggest that control may serve as a protective mechanism when it is effective in collecting relevant information from their children. Similar results were found in a study by Soenens, Vansteenkiste, Luyckx et al. (2006) where behavioral control predicted parental knowledge which in turn reduced substance use and delinquency.

The results regarding parental closeness showed (compared to control) different results. Regarding alcohol use and smoking, a similar association among closeness, knowledge and behavior was found. Those parents which were perceived by children to be close to them were able to reduce risk behavior significantly. Mediation by knowledge of this associations reduces this direct effect, but both – direct and indirect effect of closeness stayed highly significant except in paternal closeness in smoking where the indirect effect was not confirmed. These results suggest that close relationships among parents and children may increase (similarly as control) parental knowledge about children whereabouts which in turn decrease risk behavior. However, closeness and knowledge seem to be two independent factor in reducing risk behavior.

Regarding sexual experience, closeness predicted later sexual onset but no indirect effect of closeness on sexual experience through knowledge was found. This interestingly suggests that close relationships may prevent early sexual experience but parental knowledge not. It may be related to the intimacy of this behavior as boys and girls provide only some information (closeness predicts knowledge) but some information may be too personal to be shared.

As for the comparison of parental control and closeness, it can be concluded that both may be seen as different but effective sources of parental knowledge which were confirmed as key factors in reducing risk behavior (Lippold, Coffman, Greenberg, 2014; Darling, Cumsille, Pena-Alampay et al., 2009). However, even if control is seen as the directive parental process it still may play a protective role in all three explored types of risk behavior. Therefore, this support the idea of the active role of parents in the prevention of their children's risk behavior. Closeness is a process different to control, which requires the mutual interaction of parents and children and may also increase the level of parental knowledge and reduce risky behavior. Therefore, the current results are in line with both major paradigms in this topic. The first one – parents shape the behavior of their children, was supported by significant associations of control on risk behavior mediated through knowledge. The second one- parent's role is less important and the interaction processes are crucial was confirmed by significant associations of closeness on risk behavior.

Implications for research

This study has shown the significant role of both types of parental processes on three types of health-risky behavior among adolescents. Therefore, parents can be seen as active persons who shape the behavior of their own children. However, some of the findings are not in line with previous studies which highlights the discussion in the literature regarding the role of parents. Such inconsistencies can by partially explained by the study design. Our research used a cross-sectional design and should thus be repeated by studies with a longitudinal approach to explore the possible causal relationship between the type of parenting and amount of health-risky behavior. From a longitudinal perspective, more attention should be paid to comprehensive models that take into account factors from multiple systems of influence. Examples of such models may include pathways in which individuals, family and environmental factors influence health risk behavior. More research attention should be paid to psychosocial predictors of risk behavior such as family and peer environment. The current results support the assumption that parental knowledge is strongly associated with all three explored types of risk behavior and also mediates the role of parental control and closeness. Further studies are needed to explore how these paths may differ depending on other factors such as the type of parental control, joint parent-child activities, child disclosure and different age of adolescents.

Implications for health practice

Despite some limitations, this study contributes to the understanding of the process underlying the associations between parental control, closeness and types of risk behavior and how this relationship may differ based on the level of parental knowledge. The results have shown that parental control and closeness are important components of parenting and are protective against alcohol use and smoking. However, their effects are partially indirect and occur through an increase in parental knowledge. The results have several intervention implications. Parental control with parent-child closeness may be salient intervention targets to improve the emotional quality of the parent-child relationship. Regarding prevention and intervention programs parent-child closeness and active parent, control needs to be included for effective parenting. Such effort may help parents of adolescent children to create warm parent-child relationship and environments that encourage their child to share them thought, feeling and emotions – effective in increasing parental knowledge.

Limitations

However, the study also has some limitations. The main one is its cross-sectional design, which can limit the understanding of the relevant pathways. A longitudinal study design, especially on different types of health risk behavior, may provide deeper insight into this issue. Also, it did not obtain information from other family members such as parents, friends or school environment. These lacking sources could increase the understanding of some inconsistencies in the field of parental processes and risk behaviors research. Finally, the present results are strongly dependent on the assumption that what participants say is what they did. Therefore, self-reported alcohol use, smoking or sexual behavior data may be vulnerable to various types of information biases, like memory effects and social desirability bias (McCallum, Peterson, 2012). However, some studies showed no type of data collection mode-dependent differences (Bates, Cox, 2008; Hines, Douglas, Mahmood, 2010). Therefore, existing research suggests that the mode of data collection may have some degree of impact on participants' responding, but the results are not specific enough to isolate which mode is best suited for which situation (McCallum, Peterson, 2012).

Conclusion

The current results contribute to the ongoing debate regarding the role of parents in risky behavior of adolescents by indicating that adolescent shares information with parents in both types of family environments – control or closeness. This may suggest that parental control perceived as the active parenting process is effective regarding the amount of knowledge from the child. This is in line with some parenting approaches that sees parents also as those who are set the rules, borders and those who actively monitor the behavior regarding the own child. However, this is not the only approach which may work. A second parenting approach parent – child closeness is not based on parents effort only but requires some level of mutual activities which to build is difficult and a more complex approach by far. The results have also shown that the role of closeness is significant whether it is mediated through knowledge or not. This may indicate the complexity of building parent- child closeness which already include some level of knowledge. On the other hand, the direct role of control on alcohol use and smoking was fully mediated through knowledge which implies that approaches, which are solely based on control which did not provide information, may not by effective in preventing risky behavior.

Parental health-related behavior and health related behavior among schoolchildren

Introduction

The role of parental health related behavior in adolescent behavior has been the topic of many previous studies. In particular, attention has been paid to smoking and alcohol consumption. Generally, it has been found that both parental smoking and alcohol use are associated with adolescents' substance use (Engels, Knibe, Vries et al., 1999; Mak, Ho, Day 2012; Flay et al., 1994; Hung, Yen, Wu, 2009; Latendresse et al., 2008; Abar, Abar, Turrisi, 2009). Bahr Hoffmann and Yang (2005) introduce Sutherland's differential associations' theory which proposes that "learning takes place according to the frequency, duration, intensity, and priority of social interactions. Adolescents are likely to acquire attitudes favorable to drug use if they associate frequently with others who use drugs and have favorable attitudes toward drug use. If those interactions occur over a long period of time, internalization of pro-drug attitudes and behaviors is more likely than if the duration of interactions is over a short period of time. Learning is more likely to occur when interactions are intense as opposed to casual and superficial" (Bahr, Hoffmann, Yang, 2005; p. 530). In this sense, early adolescents have long and intense interactions primarily with their parents. Therefore, we may still consider parents as important models for risk behaviors in early adolescence. The examination of early adolescence specifically as a time of first experimenting with smoking and alcohol consumption is of high importance because of the possibility of early implementation of prevention strategies.

The first impulse for studying the impact of parental risk behavior on the risk behavior of their offspring can be found in the Social learning theory (Bandura, 1977). In line with this theory, for an adolescent parental behavior can become a model behavior by observing it. This modelling is effective in particular if the behavior is observed on regular basis and if the relationship with the model is good. Although, while the Social learning theory offers an important framework for understanding the influence of parental behavior on adolescents' behavior, there is a need to go beyond modelling. The direct modelling effect can

also be mediated via other factors. In the following chapter, attention will be paid to the possible mediators of the effect of parental risk behavior on their offspring's behavior. As this link seems to differ according to the substance that is used, the effects of parental smoking and parental alcohol use will be presented in separate sections.

Parental smoking behavior

Parental smoking has been associated with adolescents' smoking both directly and indirectly. A direct effect has been found among 13 to 18 years old in Hong Kong (Mak, Ho, Day, 2012), among approximately 17 year olds in The Netherlands (Engels, Knibbe, Vries et al., 1999), ten to fourteen years old in The Netherlands (Harakeh, Scholte, Vermulst, et al., 2004), adolescents in Southern California (Flay et al., 1994) or 15 years old in Slovakia (Madarasová-Gecková et al., 2005). The direct effect is usually attributed to the previously discussed social learning theory and adolescents' modelling behavior. However, somewhat different results have been presented by Engels, Vitaro, Blokland et al. (2004) who found this direct association only cross-sectionally but not longitudinally.

Besides the direct effect of parental smoking on adolescent smoking behavior, parental smoking can be associated with several factors (mediating variables) that in turn are connected to adolescents' smoking. In the previous research, the role of several possible mediators has been studied.

Flay et al. (1994) found that parental smoking was associated with their offspring's smoking initiation as well as smoking escalation only indirectly via perceived parental approval, negative outcome expectations and smoking intentions.

The indirect effect has been found also in the work of Harakeh, Scholte, and Vermulst, et al. (2004). The case of having smoking parents increased the probability of smoking both directly and indirectly via adolescents' attitudes toward smoking and their smoking intentions.

Several other papers have been published on the topic of parental smoking status. While the authors of these papers did not explicitly study the indirect effect of parental smoking, the results of their studies, however, did suggest the possibility of this effect. Blokland et al. (2007) found that smoking and non-smoking

parents differ in the way they control adolescents. In the group of adolescents with non-smoking parents, the parental control was associated with a higher probability of quitting smoking as compared to the group with smoking parents. The authors suggest that it is not parental smoking per se but the way they exert control that affects adolescents' smoking. Engels, Vitaro, Blokland et al. (2004) studied the effect of parental smoking on the probability of choosing a smoking friend. The results of their longitudinal study confirmed that children of smoking parents were more likely to find a smoking peer when establishing a new friendship. Furthermore, they found the effect of peer smoking on adolescents smoking; therefore the possible indirect influence of parental smoking status on adolescents' smoking via choosing smoking friends can be expected.

Another possibility of the indirect effect discussed by Engels and Bot (2006) is via smoking specific parenting. Smoking parents are less likely to be engaged in smoking-specific prevention practices as a result of expected inconsistency between their attitudes and behaviors. In line with this, Kodl and Memestein (2004) found that parents with a history of smoking were less efficacious, held weaker anti-smoking beliefs, and less often reported household smoking rules.

Parental alcohol use

In a similar way to smoking, parental alcohol use has been found to be positively associated with adolescents' alcohol use. Parental alcohol consumption increased the risk of drinking behavior of early adolescents (Hung, Yen, Wu, 2009), middle adolescents (Latendresse et al., 2008) as well as university students (Abar, Abar, Turrisi, 2009)

With respect to alcohol consumption there is a need to distinguish between occasional, social drinking and heavy or episodic binge drinking. This implies both for parents and adolescents. In previous studies, attention has been paid mainly to parental heavy drinking behavior (Vermeulen-Smit et al., 2012). Lieb et al. (2002) studied the association between maternal and paternal alcohol use disorders and non-problematical, social drinking in offspring. They found this association to be minimal, but there was a strong effect for the transition to hazardous use and for alcohol abuse of adolescents.

The possible mediators of the link between parental smoking and adolescents' smoking have been examined so far in this chapter. With regard to parental alcohol use, one more mediator should be considered. There is evidence that parental drinking, in contrast to smoking, may affect parenting practices and this in turn increases adolescents' alcohol use. Parental alcoholism was associated with parental behavioral undercontrol (King, Chassin 2004) and parental alcohol consumption with less parental monitoring of adolescents' activities (Latendresse et al., 2008). Although, no evidence was found for lower levels of parental support among alcoholic parents (King, Chassin 2004) nor among problematic drinkers (Van Zundert et al., 2006). Among early adolescents, parental alcohol use had a significant effect on first alcohol use even after controlling for parental support and family conflict (Hung, Yen, Wu, 2009). Therefore, several parenting variables will be considered as possible mediators of the associations between parental and adolescents' alcohol consumption within the present study.

Further mediators that will be considered are perceived parental approval of drinking and number of drinking friends. Mares, Van Der Vorst, Engels et al. (2011) found that benevolent parental attitudes about alcohol were related to more excessive drinking in adolescents.

One very interesting finding has been presented by Latendresse et al. (2008). Their research showed that the mediating role of parenting decreases between early and later adolescence, despite the increasing influence that parents alcohol related behaviors have on their adolescents drinking behaviors.

Although we were not aware of any study exploring the effect of parental alcohol use on the selection of drinking peers, based on the previous results on smoking this association was also expected.

Aim

To conclude, the main aim of the present study is to explore the associations between parental health related behavior (smoking, weekly alcohol consumption and drunkenness) and health related behavior of their children. Further, we will test the possible indirect effect via several mediators proposed within the introduction (for smoking: perceived parental approval of substance use, estimated number of using friends, for drinking also parental rules setting, parental knowledge of adolescent's whereabouts and parental support were added in the analyses).

Sample

The sample for the study consisted of 1292 respondents. Data were collected in Slovakia in 2011. The sampling used a list of primary schools retrieved from the Institute of Information and Prognosis of Education (total 2,202 schools). Using a cluster randomized sampling, 60 schools were selected for the study. In each school, a single class of six graders was involved in this research. Those respondents who had more than 40% of missing values were excluded from the analyses. The total sample of respondents for this study than consisted of 1098 respondents, 54.4% females, mean age 11.52 years (SD 0.61).

Measures

The following measures, used within this study, were drawn from the international study ESPAD 2011 (Substance use among students in 36 European countries) (Hibell et al., 2012).

Adolescents' health related behavior was measured using single items for each type of behavior. *Smoking*: „On how many occasions (if any) during your lifetime have you smoked cigarettes?"; *alcohol use*: „On how many occasions (if any) have you had any alcoholic beverage to drink in your lifetime?"; *drunkenness*: "On how many occasions (if any) in your lifetime have you been intoxicated from drinking alcoholic beverages for example staggered when walking, not being able to speak properly, throwing up or not remembering what happened?" Possible answers to each question were on 7 point scale ranging from "0" to "40 times and more".

Subsequent dichotomization was made for each type of health related behavior – experience versus non experience. As the research sample consisted of 11 year old early adolescents, any experience with such behavior was considered as unwanted. Therefore, the dichotomization (no experience versus 1 and more times) was very strict. The only exception was alcohol consumption where those who had 1 to 2 experiences with alcohol were considered as „non-drinkers".

Using friends. Respondents indicated the estimated number of friends that use particular substance. Three separate questions were used: "How many of your friends would you estimate smoke cigarettes? How many of your friends would you estimate drink alcoholic beverages? How many of your friends would you estimate get drunk?" The possible answers for each question were on a 5 point Likert scale: none; a few; some; most; all.

Perceived parental approval. Questions used to measure perceived parental approval of adolescents' risk behavior were modified. Four questions were asked regarding the approval of smoking and beer drinking for father and mother separately. "Do you think that your father/ your mother would allow you to smoke/ drink beer/drink wine/ drink spirits?" Four possible answers were used: Would allow me to do so, Would allow me but not at home, Wouldn't allow at all, I don't know. Those who responded „I don't know" were excluded from analyses. The answers were dichotomised into would allow versus wouldn't allow. For the approval of drinking behavior the question about approval of beer has been used.

Beside measures adapted from the ESPAD study, parental risk behavior and other parenting variables were also asked about.

Parental smoking and alcohol consumption were assessed asking: "Does your mother/ father smoke cigarettes every day?" "Does your mother/ father drink alcoholic beverages at least once a week?" "Does your mother/ father get drunk at least once a month?" with possible answers yes, no, don't know. Those answering "don't know" were excluded from analyses.

Parental support. Parental support was measured using one subscale of the Resilience and Youth Development Module (Hanson, Kim, 2007). The subscale consists of six statements about the support that (at least) one parent gives the adolescent (e.g. Your parent listens when you have something to say. Your parent believes that you can do a good job.) Respondents agreed or disagreed with a statement on a 4-point scale ranging from 1 definitely false to 4 definitely true. The sum score was computed, in that the higher score means better support from parents.

Parental rules setting. Two questions were used to determine parental rules setting: „My parents set definite rules about what I can do at home." „My parents set definite rules about what I can do outside the home." Respondents had 5 possible answers ranging from 1 almost always to 5 almost never. The sum score for the two questions was computed and reversed so that a higher score means more rules setting.

Parental knowledge. In a similar way to the previous measure, parental knowledge was assessed using two questions: „My parents know whom I am with in the evenings." „My parents

know where I am in the evenings.“ The sum score was then computed and reversed, so that a higher score means better parental knowledge.

Both, parental rules setting and parental knowledge measures were used in the ESPAD study (Hibell et al., 2012).

Statistical Analyses

All the data in the present study were analyzed using the statistical software package IBM SPSS Statistics, version 21. Firstly, differences between the perceived parental approval of risk behavior between boys and girls were analyzed using chi-square. Secondly, regressions were used to analyze the associations of parental risk behavior (smoking, alcohol consumption, drunkenness) and several possible mediators. Subsequently, logistic regression was run to assess the effect of parental risk behavior on adolescents‘ risk behavior.. In the next step, mediational analyses were run using the procedure described by Baron and Kenny (1986). The significance of the indirect effect (mediating effect) was tested using the Sobel test (Z). As some of the mediators and all outcome variables were dichotomous, it was necessary to make the regression coefficients comparable across equations. This was done using the method proposed by MacKinnon and Dwyer (1993) (see also Herr, 2011) by multiplying each coefficient by the standard deviation of the predictor variable in the equation and then dividing by the standard deviation of the outcome variable.

Results

Descriptive statistics

Table 23 shows the prevalence of adolescent’s risk behavior. 15.5% of 11 years old adolescents have smoked in their life, 18.10% have drunk alcohol more than two times in their lifetime and 5.6% have been drunk.

Table 23 Percentage of respondents reporting risk behavior

	never		yes		never, 1to2 times		more than 3 times	
	N	%	N	%	N	%	N	%
smoking ever	927	84.4	170	15.50				
drinking alcohol ever					887	80.8	199	18.1
being drunk ever	1028	93.6	62	5.6				

Table 24 presents the prevalence of parental risk behavior. Nearly 29% of fathers and 17% of mothers were considered by their offspring as daily smokers, about 37% of fathers and 20% of mothers as consuming alcohol at least once a week and adolescents reported 11% of their fathers and 3% of their mothers to be drunk at least once a month.

Table 24 Parental risk behavior as reported by adolescents

	father			mother		
	yes	no	don't know	yes	no	don't know
daily smoking	28.7	67.5	3.7	17.3	79.1	3.6
weekly drinking	37.7	50.6	11.8	19.9	70.9	9.2
monthly drunkeness	11.3	79.9	8.8	3.1	92.7	4.2

Perceived parental approval of adolescents' risk behavior is presented in Table 23. Adolescents were asked whether their parents would approve of their smoking, beer, wine and spirit drinking. Adolescents' perception of approval of beer drinking was used in subsequent analyses. Generally, adolescents perceived their parents as not approving of smoking and spirit drinking while the perceived approval of beer drinking was relatively high (16.5% and 11.5% for boys and girls respectively). No significant differences between boys and girls were found with an exception of perceived father's approval of beer drinking where boys perceived their fathers as more approving outside beer drinking than girls (χ^2= 16.76, p≤ 0.001).

Mediating variables

The main aim of this study was to assess possible mediators of the relationship between parental and adolescents' risk behavior. To fulfill this aim, the effect of parental risk behaviors on possible mediators was studied in this study. The results of the regression analyses can be seen in Table 25. All analyses have been adjusted for the gender of adolescents.

With regard to father's risk behavior, paternal smoking was associated with a higher probability of paternal approval of adolescents' smoking (p≤0.01) and increased number of smoking friends (p≤0.001).

Table 25 Percentage of perceived parental approval of adolescents‘ risk behavior

	smoking			beer			whine			spirit		
	boys	girls	X^2	boys	girls	X^2	boys	girls	X^2	boys	girls	X^2
father												
would agree	1.3	1.3		10.5	9.9		4.8	3.6		0.9	0.4	
would agree but not at home	0.4	0.5		6.2	1.6		2.4	0.9		1.3	0.2	
definitely wouldn‘t agree	82.4	85.4		58.5	64.1		71	74.6		82.8	88.2	
I don‘t know	15.8	12.8	2.49ns	24.5	24.4	16.76***	21.8	20.8	5.93ns	15	11.3	7.12ns
mother												
would agree	0.9	2		6.3	9.1		3.5	3.4		0.4	0.4	
would agree but not at home	0.4	0.5		4.6	2.7		2.6	1.4		0.7	0	
definitely wouldn‘t agree	86.1	89.4		69.4	69.2		74.7	79.4		85.1	90	
I don‘t know	12.6	8.1	2.78ns	19.7	19	5.4ns	19.2	15.7	3.16ns	13.8	9.6	5.05ns

ns – not significant

Adolescents with fathers that consumed alcohol at least once a week perceived their fathers as approving of drinking beer ($p \leq 0.001$), had more drinking friends ($p \leq 0.001$) and perceived their parents to set fewer rules ($p \leq 0.05$). The level of parental support and parental knowledge were not significantly associated with paternal alcohol consumption. Having a father who is drunk at least once a month increased the probability of perceived beer drinking approval ($p \leq 0.001$) and higher number of drunk fiends ($p \leq 0.001$) but was not associated with any of the parenting variables.

With regard to mother's risk behavior the results were similar. Maternal smoking increased the risk of perceived mother's approval of smoking ($p \leq 0.05$) and higher number of smoking friends ($p \leq 0.001$). Drinking alcohol at least once a week was associated with both perceived approval of beer drinking and number of drinking friends ($p \leq 0.000$), but was not associated with any of the parenting variables. On the other hand, having mother drunk at least once a month increased the probability of perceived approval ($p \leq 0.001$) but not the number of drunk friends. Maternal drunkenness was associated with less parental knowledge ($p \leq 05$) and less parental support ($p \leq 0.001$), but not with rule setting.

Those variables that were associated with parental risk behavior have been subsequently used as possible mediators in the analyses. The results of logistic regression analyses together with the results of a Sobel test of the indirect effect (mediation) are presented in Tables 26, 27 and 28. All analyses have been adjusted for the gender of the adolescents.

Parental smoking

Both paternal and maternal smoking was strongly associated with increased risk of adolescents' smoking ($p \leq 0.001$) (Table 26). With regard to a mediating effect of perceived parental approval of smoking and number of smoking friends, the results were similar for fathers and mothers. Both, perceived paternal and maternal approval and number of friends were highly associated with adolescents' smoking ($p \leq 0.001$). Although the direct effect of parental smoking on adolescents' smoking remained significant, a partial mediating effect of these variables was confirmed by a Sobel test ($Z=2.18$ and $Z=1.83$ for approval, $Z=3.98$ and $Z=3.67$ for friends, for fathers and mothers respectively).

Table 26 The effect of parental risk behavior on possible mediators. The results of regression analysis. All analyses were adjusted for gender of respondents.

	B	S.E.	p
father smokes on approval	1.29	0.481	0.008
father smokes on friends	0.232	0.053	0.000
father drinks on approval	1.06	0.204	0.000
father drinks on friends	0.215	0.05	0.000
father drinks on rules	-0.368	0.157	0.019
father drinks on support	0.22	0.35	0.531
father drinks on knowledge	-0.33	0.196	0.094
father drunk on approval	0.069	0.265	0.000
father drunk on friends	0.216	0.05	0.000
father drunk on rules	-0.388	0.231	0.093
father drunk on knowledge	-0.362	0.289	0.211
father drunk on support	-0.629	0.516	0.223
mother smokes on approval	1.014	0.479	0.034
mother smokes on friends	0.251	0.063	0.000
mother drinks on approval	1.01	0.233	0.000
mother drinks on friends	0.222	0.059	0.000
mother drinks on rules	-0.204	0.184	0.269
mother drinks on support	-0.247	0.41	0.547
mother drinks on knowledge	-0.212	0.231	0.359
mother drunk on approval	1.56	0.448	0.000
mother drunk on friends	0.174	0.09	0.054
mother drunk on rules	-0.795	0.418	0.058
mother drunk on knowledge	-1.32	0.522	0.012
mother drunk on support	-3.416	0.924	0.000

Parental alcohol consumption

Both paternal and maternal weekly alcohol consumption was associated with an increased risk of adolescents' drinking experience ($p \leq 0.001$) (Table 27). After adding perceived parental approval into the model, the effect of both paternal and maternal alcohol disappeared and was fully mediated by perceived parental

approval (Z=4.52; Z=3.77 for mother and father respectively). The number of drinking friends mediated the association partially (Z=3.92; Z=3.39 for mother and father respectively). When studying the effect of parental alcohol consumption, also several parenting variables were considered as possible mediators. In previous analyses (Table 25), only setting rules was associated with father's alcohol consumption. Although lack of setting rules was associated with adolescents' alcohol consumption (p≤0.05) it did not mediate the effect of paternal alcohol consumption on adolescents' consumption (Z=1.63).

Table 27 The effect of parental smoking on adolescents smoking

						Sobel test		
father		B	S.E.	OR	sig	Z	S.E.	sig
model 1	father smokes	0.882	0.191	2.41	0.000			
model 2	father smokes	0.724	0.226	2.06	0.001			
	father's approval	1.910	0.503	6.74	0.000	2.18	0.02	0.030
model 3	father smokes	0.688	0.207	2.00	0.001			
	smoking friends	1.101	0.124	3.00	0.000	3.98	0.01	0.000
mother		B	S.E.	OR	sig	Z	S.E.	sig
model 1	mother smokes	0.921	0.209	2.51	0.000			
model 2	mother smokes	1.000	0.229	2.72	0.000			
	mothers' approval	1.782	0.485	5.94	0.000	1.83	0.02	0.070
model 3	mother smokes	0.713	0.229	2.04	0.002			
	smoking friends	1.015	0.121	2.81	0.000	3.67	0.01	0.000

Model 1 represents the direct effect of parental smoking on adolescents smoking. Models 2 and 3 reflect the indirect effect via mediating variable. Results of Sobel test are presented. Results of logistic regression are adjusted for gender of respondents.

Parental drunkenness

Only maternal drunkenness (at least once a month) was associated with adolescents' drunkenness (p≤0.05) (Table 28). However, as a recent approach on meditational analyses (Kenny, Jude, 2013) showed that the direct effect of an independent variable is not essential for a possible mediating role of other variables, the study continued with examining the possible indirect effect of parental drunkenness via paternal approval,

maternal approval, parental support and knowledge (variables that had been associated with both parental drunkenness (see Table 25) and adolescents' drunkenness) for both parents.

Table 28 The effect of parental weekly alcohol consumption on adolescents alcohol experiences

						Sobel test		
		B	S.E.	OR	sig	Z	S.E.	sig
model 1	father drinks	0.580	0.179	1.79	0.001			
model 2	father drinks	0.271	0.231	1.31	0.241			
	father's approval	2.101	0.237	8.15	0.000	4.52	0.03	0.000
model 3	father drinks	0.409	0.193	1.506	0.004			
	drinking friends	1.064	0.126	2.91	0.000	3.92	0.01	0.000
model 4	father drinks	0.523	0.184	1.69	0.005			
	rules setting	-0.093	0.041	0.91	0.024	1.63	0.01	0.103
mother		B	S.E.	OR	sig	Z	S.E.	sig
model 1	mother drinks	0.701	0.197	2.01	0.001			
model 2	mother drinks	0.374	0.252	1.45	0.138			
	approval	1.894	0.252	6.65	0.000	3.77	0.02	0.000
model 3	mother drinks	0.502	0.213	1.65	0.018			
	friends	1.152	0.129	3.17	0	3.39	0.01	0.000

Model 1 represents the direct effect of parental alcohol consumption on adolescents' drinking. Models 2, 3 and 4 reflect the indirect effect via mediating variable. Results of Sobel test are presented. Results of logistic regression are adjusted for gender of respondents.

For paternal drunkenness, the indirect effect via perceived paternal approval of beer drinking (Z=2.46) and number of drunk friends (Z=3.5) was confirmed. The effect of maternal drunkenness was mediated by perceived maternal approval of beer drinking (Z=2.62) and the lack parental knowledge (Z=2.03); surprisingly however, it was not mediated by parental support (Z=1.61) (Table 29).

Table 29 The effect of parental drunkenness on adolescents' drunkenness

						Sobel test		
father		B	S.E.	OR	sig	Z	S.E.	sig
model 1	father drunk	0.637	0.388	1.89	0.101			
model 2	father drunk	0.601	0.434	1.82	0.166			
	father's approval	1.210	0.363	3.35	0.001	2.46	0.02	0.014
model 3	father drunk	0.272	0.437	1.30	0.533			
	drunk friends	1.610	0.271	5.01	0.000	3.51	0.01	0.000
mother		B	S.E.	OR	sig	Z	S.E.	sig
model 1	mother drunk	1.097	0.559	2.99	0.050			
model 2	mother drunk	1.16	0.612	3.20	0.058			
	mother's approval	1.43	0.361	4.17	0.000	2.62	0.02	0.009
model 3	mother drunk	0.934	0.662	2.54	0.158			
	parental support	-0.061	0.034	0.94	0.068	1.61	0.03	0.107
model 4	mother drunk	0.927	0.572	2.53	0.105			
	parental knowledge	-0.171	0.051	0.84	0.001	2.03	0.02	0.040

Model 1 represents the direct effect of parental drunkenness on adolescents' drunkenness. Models 2, 3 and 4 reflect the indirect effect via mediating variable. Results of Sobel test are presented. Results of logistic regression are adjusted for gender of respondents.

Discussion

The main aim of this study was to explore whether parental risk behavior is associated with adolescents' behavior and whether this association can be explained by potential mediating variables. In general, both paternal and maternal smoking was associated with adolescents' smoking directly and indirectly via perceived paternal and maternal approval of adolescents' smoking and via affiliating with smoking friends as mediating variables. As for parental weekly drinking, the strong direct association with adolescents' drinking was fully mediated by the perceived approval of beer drinking and partially mediated by the number of drinking friends. Although increased rule setting was associated with paternal drinking, it did not mediate the relationship between paternal and adolescents' drinking. Paternal drunkenness was not directly associated with adolescents' drunkenness, but an indirect effect via perceived approval and estimated number of drunk friends was found. On the other hand, maternal drunkenness was associated with adolescents' drunkenness. This relationship was explained by perceived

approval of drinking and lack of parental knowledge. However, the indirect effect of parental support has not been confirmed.

Several researchers suggest that risk behavior in adolescence is more or less normative (Engels, Bot, 2006). In early adolescence (around 11 years), however, smoking and alcohol consumption cannot be considered as normative behavior yet. Therefore, in this study experimentation with cigarettes and alcohol (not only regular use) were considered as risk behaviors.

When studying the effects of parental drinking on adolescents, the possibility of lower levels of some parenting characteristics due to parental alcohol consumption was considered. The current results are more or less consistent with those published earlier (van der Zwaluwm et al., 2008; King Chassin, 2004; Van Zundert, Van der Vorst, Vermulst et al., 2006). These report that parental alcohol consumption is in general not associated with parenting or that this association is only weak.

Consistently within this research, parental risk behavior was associated with an increased number of risky friends. This could be attributed to two factors. Firstly, adolescents with parents that smoke or drink alcohol on a regular basis may perceive this type of risk behavior as the norm, and thus not avoid peers that behave riskily. Secondly, parenting behavior toward risky friends approval (such as strict substance specific rules setting, parental control, rules about leisure time activities, explicit risky friends disapproval) might be weakened (lessened) when parents smoke or drink alcohol themselves and this might be associated with the affiliation with risky friends.

The results further show that both parental smoking and drinking behavior are directly associated with adolescents smoking and drinking respectively. This direct association could be attributed to adolescents' modeling of parental behavior proposed by social learning theory. This modeling effect seems to be stronger with regard to parental smoking as neither perceived parental approval of smoking nor estimated number of smoking friends fully mediated the association.

The results further indicate, that smoking parents tend to be perceived as more permissive in terms of smoking and adolescents of smoking parents have more smoking friends which in turn affects adolescents' smoking experience. Sargent and Dalton (2001) in their study found the effect of perceived parental

disapproval of smoking to be even stronger than the effect of parental smoking. The effect of parental disapproval was the same for smoking and non-smoking parents. Engels and Bot (2006) discuss the possibility that smoking parents do not apply strong anti-smoking attitudes as they feel incongruence between their attitudes and their behavior. Sargent and Dalton's (2001) research, however, shows that parental disapproval of smoking is efficient regardless parents smoke or not. They further suggest that parents' disapproval makes adolescents more resistant to the influence of peer smoking. The current results together with the results of Sargent and Dalton (2001) suggest that adolescents who perceive that their parents would not allow them to smoke are less likely to smoke.

The direct effect of parental alcohol consumption on adolescents' experiences with alcohol was fully mediated by perceived parental approval of beer consumption. In line with these results, Yu (2003) presented that the extent to which parents prohibit children from using alcohol at home tends to reduce children's alcohol involvement. These results seem to be highly relevant particularly with regard to prevention. Parental weekly alcohol consumption is often perceived as normative (having a glass of wine or beer after dinner or in the evenings). Within prevention, it will probably not be able to change parental behavior regarding alcohol consumption. What can be changed, however, are parental attitudes toward strict prohibition of alcohol consumption of their children. In particular, at the age of 11, alcohol consumption is strongly unacceptable as early alcohol consumption is associated with the development of early alcohol dependence and abuse (Gruber, DiClemente, Anderson et al., 1996; DeWit, Adlaf, Offord, et al., 2014).

Parenting behavior explained the association between parental drinking and adolescent's drinking only partially. Similarly, White, Johnson, Buyske et al. (2000) presented that parent drinking rather than parenting behavior predicted heavy drinking in their offspring.

Future research

Within this study, parental risk behavior as a possible independent variable associated with adolescents' risk behavior was conceptualized. Besides this, there is another way how parental risk behavior could be connected to the behavior of their offspring. It can serve as a buffer (moderator) between the third variable and adolescents' risk behavior. Li et al. (2002) reported

that non-using parents had a buffering effect on friends' influences to use substances, such that friends' use did not affect adolescent use when parents were non-users. There is also a possibility that rule setting, substance specific rules in particular, is effective only among non-using parents. This possible moderating role of parental risk behavior should be verified in further research.

Secondly, in terms of parenting, substance specific parenting (such as substance specific rules setting, substance specific monitoring, etc.) would be useful in the context of adolescents' risk behavior. Similarly, the increased availability of cigarettes and alcohol at home among adolescents with smoking and drinking parents may be associated with their risk behavior. Further research is needed on this topic.

Limitations

Several limitations of the present study should be mentioned. Firstly, all the data were collected among single informants – adolescents. Adolescents reported not only their own behavior, but also their parents' behavior. Further, adolescents stated what they think their parents would do. Using adolescents as single informants can lead to obtaining different data than would be obtained from parents. In research among 270 American families, Cottrell et al. (2003) found no relationship between parental and adolescents' perceptions of parental monitoring. In their sample, around 75% of parents reported that they always knew where their adolescents were after school, at night and so on, while only about 58% of adolescents reported their parents knew so. The reason for such discrepancy might be that although parents and their children report on the same relationship (or situation), they experience different stressors, social environments and expectations. Thus, they would be expected to perceive their relationships somewhat differently (Pelton, Forehand, 2001). However, further research shows that although there is a discrepancy between adolescents' and parental reports, mainly adolescents' but not parental reports are associated with diverse outcomes. Abar, Jackson, Colby et al. (2014) for example found that only adolescents' reports on parental monitoring are associated with adolescents' alcohol use. In another study, only adolescents' and not the mother's perception of mother-adolescent conflict was associated with adolescents' perceptions of their adjustment (Pelton, Forehand, 2001). Therefore, it can be assumed, that despite the possible discrepancy between adolescents' report on parental risk behavior and the actual

situation, adolescents self-reports are valid in the context of adolescents' risk behavior.

Secondly, the data on parenting behavior are not gender specific. Respondents were asked to indicate parental knowledge, rules setting and support in general not for the particular parent. This could influence the results regarding the mediating effect of parenting.

Thirdly, the design of the study was cross sectional and thus does not allow causal conclusions to be made. These days, however, a one year follow up data collection is in process and the data presented within this study will be further analyzed longitudinally.

Implication for practice

Within adolescents' risk behavior prevention it is often problematic (and sometimes not realistic) to force parents to change their habits regarding their smoking and alcohol consumption to protect their children from unwanted risk behavior. It is also very difficult to change or to influence general parenting style (Chassin et al., 2005). Therefore, it is important to look at small steps such as changes that parents can do to protect their children. In line with the present results, there is a possibility to encourage parents to improve their anti-smoking and anti-drinking attitudes and make them clear to adolescents to decrease the probability in them engaging in risk behavior. This seems to be highly relevant particularly for parents that drink alcohol on a non-problematic weekly basis and their attitudes toward adolescents' beer consumption.

There is a need to prevent adolescents' risk behavior very early, even before the first experimentation with a substance, as there is evidence that children form memory associations related to alcohol before they ever drink alcohol themselves. Parental drinking is related to these associations which in turn predict adolescent alcohol use a year later (van der Vorst et al., 2013).

Conclusions

Despite the mentioned limitations, the present study contributes to the knowledge on the effect of parental risk behavior on adolescent risk behavior. It shows that modelling of parental risk behavior occurs among early adolescents with an exception of paternal drunkenness. Parents, influence their children's behavior also indirectly via perceived parental approval of risk behavior, affiliating with friends that behave riskily and for alcohol consumption also via several parenting characteristics.

Effectiveness of the substance use prevention program Unplugged with respect to lifetime prevalence of tobacco cigarette smoking among schoolchildren

Introduction

The International study ESPAD (European school survey project on alcohol and other drugs) (Hibell et al., 2012) has been monitoring substance use of 15-16 year old adolescents in 37 countries since 1995. The last outcomes have shown (Hibbel et al., 2011; European monitoring centre for drugs and drug addiction, 2012) that 38% of boys and 39% of girls report that they have smoked cigarettes in the last 30 days. Many of the risk factors that affect later substance use are present since childhood and therefore early prevention of substance use is an important characteristic of these programs (Gottfredson, Willson, 2003).

The importance of school-based prevention program lies in the opportunity to reach out and affect a large number of children so that the forming behavior related attitudes can be influenced (Vaňová, 2012; Lemstra et al., 2010). Universal prevention takes into account general population regardless of the level of risk (Botvin, Griffin, 2006; Sloboda, 2006). In general, universal prevention programs implement three approaches or strategies (Botvin, Griffin, 2006; McGuire, in Thomas, Perera, 2006; Skara, Sussmann, 2003; Botvin, 2000; Tobler et al., 2000): providing information, social influence approach, and life skills approach. Providing information includes information about addictive substances, health and social consequences of their use as well as normative education. In the social influence approach adolescents' drug use is conceptualized as the result of the influences from adults, peers and the media with an additional important component which is raising awareness of these influences. The three major components of social influence approach are psychological inoculation, normative education, and resistance skills training. In the life skills approach drug use is considered to be learned behavior which is reinforced by adolescents' prodrug cognitions, attitudes, and beliefs. Susceptibility to social influence increases with poor social and personal skills.

One of the basic principles of „Prevention science“, in contrast to „intuition based prevention“, is to lay the foundation of prevention programs on a theoretical background. This background and its theories rely on research of protective and risk factors of substance use. Petraitis, Flay and Miller (1995) have summarized the theories of substance use among adolescents into the following categories: (a) Cognitive-affective theories of substance abuse, (b) Social learning theories, (c) Conventional commitment and social attachment theories, (d) Theories in which intrapersonal characteristics play the key role and (e) Theories That Integrate Cognitive-Affective, Learning Commitment and Attachment, and Intrapersonal Constructs

Evaluation of substance abuse prevention is trying to reach several goals (Hansen, 2002): (a) define and examine goals related to process evaluation (focusing on the quality and the extent of implementation and the degree to which risk and protective factors or targeted mediators are changed, (b) evaluation of outcomes (a degree to which a program has changed substance use and abuse), c) impact evaluation (the extent to which consequences related to substance use and abuse have been reduced).

Mediation is a way, how to explain the process, or mechanism, through which one variable affects another (MacKinnon, Fairchild, Fritz, 2007). The importance of mediational mechanisms in evaluation studies of prevention programs consist of the integration of the „active ingredients“. The Mediation analysis also provides information on how to improve existing programs in future development of prevention programs (Botvin, Griffin, 2004). In following part, theoretical background of the expected mediators of the program Unplugged will be presented. Special attention will be payed to the examination of self-esteem and descriptive normative beliefs as the mediators of program effectiveness. Self-esteem as well as descriptive normative beliefs are important with regard to the theoretical background of the program Unplugged (Varducci et al., 2013). These two variables are relevant especially during the development in early adolescence, are an essential part of effective prevention programs and largely correspond with the content of the program Unplugged.

Self-esteem

Self-esteem has been defined as a global evaluation of personal worth (Rosenberg, in Heatheron, Wyland, 2003; Leary, Baumaister, 2000; Coopersmith, 1967). From middle childhood to preadolescence, two cognitive advancements allow for interpersonal influences on self-esteem (Harter, 1999). Firstly, improved perspective taking skills help preadolescents to appreciate the appraisals of others. Secondly, the newly developed ability to form higher order concepts allows preadolescents to make global self-evaluations rather than concrete and domain-specific self-evaluations.

Since self-esteem is relatively unstable in preadolescence (Harter, 1999) it might be assumed that ongoing appraisals of oneself by others have a particularly strong impact at this age. The development of self-esteem during childhood and adolescence depends on a wide variety of intra-individual and social factors. Approval and support, especially from parents and peers, and self-perceived competence in domains of importance are the main determinants of self-esteem (Harter, 1999; Shadmon, in Mann, Hosman, Schaalma et al., 2004).

Although, there is evidence supporting exactly contrary (Baumeister et al. 2003). Self-esteem is considered to be a protective factor against substance abuse. Botvin, Griffin and Macaulay (2003) have reported the positive effect of self-esteem on attitude change and/or a decline in drug consumption in their life skills programs. Cultivation of competencies and positive relationships, as well as self-protective and self-enhancing strategies with others that represent an appropriate fit with norms and adaptive demands of surroundings (e.g. home, school and etc.) and the larger society or culture are important for successful adaptation and health promotion (Du Bois, Flay, 2004).

School-based prevention programs which are interactive and focused on skills development, offering group work can lead to self-concept changes. Swan et al. (2007) have provided evidence that programs designed to improve self-esteem reduce problem behavior, including substance use (DuBois, Flay, 2004; Haney, Durlak, 1998).

Normative beliefs

According to cognitive affective theories and social learning theories, cognitive factor is represented by the reasons for substance use which lead or cause this behavior. The term "normative belief" refers to individual's perceptions about how much his or her close friends use substances and approve of such use (Perkins, 1997). Individuals often misperceive the prevalence of a behavior (i.e., descriptive norms) in their social environment (Clapp, McDonnell, 2000; Berkowitz, 2004; Borsari, Carey, 2003). This misperception has been found to be positively related to interpersonal discussion about the topic (Real, Rimal, 2007).

Normative beliefs generally predominate as predictors of substance use among young people (Morgan, Grube, 1989) and have been found to mediate the relationship between social norms and behavior (Maddock, Glanz, 2005). In adolescence, individuals become less reliant on parental influences in making their decisions about substance use and turn instead to their friends and peers. Peer behavior is more important in predicting adolescent alcohol use than are the normative beliefs and attitudes of the parents (La Brie, Hummer, Lac et al., 2011; Windle, 2000; Sutherland, Shepherd, 2001; Botvin et al., 1992, Moncher, Holden, Schinke, 1991).

Perception of friends' use was found to be more important than actual friends' behavior among adolescents (Iannotti, Bush, 1992) and normative beliefs about friends (proximal normative beliefs) are stronger predictors of behavior than are students' normative beliefs about their peers in general (general social norms) (Cox, Bates, 2011; Maddock, Glanz, 2005; Morgan, Grube, 1991).

Several intervention studies based on the confrontation of participants with the actual norms to reduce their misperceptions and reduce substance use have proven successful (DeJong et al., 2006; Moreira, Smith, Foxcroft, 2009; Turner, Perkins, Bauerle, 2008; Carey, Scott-Sheldon, Carey, et al., 2007; LaBrie, Hummer, Grant, et al., 2010). Furthermore, mediation analysis of prevention programs has identified that social prevalence and social acceptability, knowledge, normative expectations, and friends' reactions to substance use are the most important mediators in prevention programs (Botvin et al., 1992; Donaldson, Graham, Hansen, 1994; Botvin, et al., 2001; Liu et al., 2009; Bate et al., 2009; Sakuma et al., 2010).

Aim

The objective of this contribution is to evaluate the effectiveness of the school-based substance use prevention program Unplugged. The exploration will be focused in particular on the lifetime prevalence of tobacco cigarette smoking among adolescents 3 months after the program implementation (T3). Further objective of this exploration is to evaluate the mediational role of self-esteem, descriptive normative beliefs about the number of friends who use tobacco cigarettes.

Method

The school-based prevention program Unplugged targets students 12–14 years of age and aims to address both the experimental and the regular use of alcohol, tobacco and illicit drugs. The program Unplugged is using a number of theories as the theoretical background (The Theory of Planned Behavior, social learning theory, social norms theory, health belief model, theory of problem behavior; (Varducci, 2013) and a comprehensive social influence model in which social influence is understood not only as a risk but also as a protective factor (Charvát, in Vaňová 2012). The Unplugged program implements a strategy based on social influence with skills enhancement and education about social drugs and negative consequences of their use.

The program Unplugged, as a part of the project Eu-DAP (European Drug Abuse Prevention) has been developed under the requirement of culturally relevant prevention program (Gabrhelík et al., 2012). The effectiveness of this program has been recently evaluated in several European countries with the participation of 7 000 pupils (Faggiano et al., 2010).

To provide a brief overview the curriculum of Unplugged will be described. The curriculum consisted of 12 lessons which were carried out once per week during the school year 2013/2014 (September – December). The program was delivered via lectures by teachers or psychologists who underwent a 3-day training course during which they were trained for the program implementation. Teachers undergoing the training had the opportunity to familiarize themselves with the program, to test the implementation of individual lessons and to discuss related issues. After the training, the teachers provided agreement with the procedures for implementing the program and were asked was to carry out a trial lesson in classroom. After each lesson their task was to complete a feedback sheet for the individual lesson. In 10 schools, out of 30, the teachers completed the form

for less than half of the lessons. These schools were excluded from the analysis due to potential problems with fidelity of the implementation.

SAMPLE

This study is a cluster randomized controlled trial with data collection immediately before program implementation (T1) and 3 months after the program implementation (T3). The schools were randomly selected and assigned to the experimental and the control groups. The sampling used a list of primary schools in Slovakia in 2011 retrieved from the Institute of Information and Prognosis of Education (total 2,202 schools). 60 elementary schools participated in the study (30 schools as the experimental and 30 as the control group). In each school, a single class of six graders was involved in this research. A total of 1283 pupils participated in research (Baseline: Mage=11.52, SD= SD=0.61; 52.3% females). Randomization was done by using a web application created for the purpose of our research. The schools were selected from different cities based their geographical locations in the Eastern, Central and Western Slovakia with 6 clusters based on the population seize. We used the division of towns and villages in terms of population according to the Statistical Office of the Slovak Republic.

In order to test mediation effect the procedure for mediation analysis with dichotomous outcome was used (Herr, 2011). The conditions for mediation analysis, taking into account possible direct and indirect mediational effects were checked (Baron, Kenny, 1986; Hayes, 2009; Rucker, Preacher, Tormala et al. 2011; Field, 2013).

MEASURES

For the purpose of our project, following measures were used:

Behavioral outcomes: lifetime prevalence of tobacco cigarettes smoking (ESPAD; Hibell et al., 2012). „How many times (if any) have you smoked tobacco cigarettes?" Items were dichotomized (0-not used, 1- used)

Descriptive normative beliefs about number of friends who use tobacco cigarettes. „According to your estimation, how many of your friends smoke tobacco cigarettes?". Item assessed on a 5-point scale (1 – Nobody, 5 – Everybody)

Self-esteem: SLCS-R: Self liking/self-competence scale - revised version (Tafarodi, Swann, 2001). This is a self-report measure of global two dimensional self-esteem. It contains 16 statements representing the dimensions of self-liking and self-competence.

According to the program content, positive self-esteem was explored as an expected mediator, measured by a 7-item scale generated by principal component analysis (Cronbach $\alpha = 0.793$). Items were assessed on a 5-point likert scale (1 – totally disagree, 5 – totally agree)

Results

The impact of the Unplugged program

Chi-square test for independence (with Yates Continuity Correction) indicated that there were no significant differences between groups in lifetime prevalence of tobacco cigarette smoking at T1 (Table 30), or T3 (Table 31).

Table 30 Lifetime prevalence of tobacco cigarette smoking (T1)

	experimental group		control group					
	N	%	N	%	χ^2	df	p	ϕ
not use	329	89.4	472	88.7	0.045	1	0.832	0.011
use	39	10.6	60	11.3				

Table 31 Lifetime prevalence of tobacco cigarette smoking and alcohol use (T3)

	experimental group		control group					
	N	%	N	%	χ^2	df	p	ϕn
not use	254	76.7	379	79.6	0.798	1	0.372	-0.03
use	77	23.3	97	20.4				

One way between-groups analysis of variance was conducted to explore the impact of the program Unplugged participation on the level of positive self-esteem at T1 and T3 (Table 32). Significant differences were found in positive self-esteem at T3. A higher level of positive self-esteem was found in the experimental group.

Independent samples Kruskal-Wallis test was conducted to explore the impact of the program Unplugged participation on the level of descriptive normative beliefs about the number of friends who used tobacco cigarettes at T1 and T3. Significant difference between the experimental and the control groups were found at T3 (Table 33).

Table 32 Differences between experimental and control groups in positive self-esteem

		mean	SD	df	F	p
positive self-esteem (T1)[1]	experimental group	24.51	4.15	1	3.71	.055
	control group	23.92	4.78	1		
	control group	23.01	5.61	1		
positive self-esteem (T3)[1]	experimental group	24.04	5.04	1	6.37	.012
	control group	23.12	5.57	1		

1T1 – baseline data collection, T2 – immediately after the end of the program, T3 – three months after the end of the program

Table 33 Differences in descriptive normative beliefs about number of friends who use tobacco cigarettes between experimental and control groups

		mean rank	df	χ^2	P
T1	experimental group	439.67	1	0.770	.380
	control group	453.01	1		
T3	experimental group	386.69	1	4.144	.042
	control group	417.74	1		

1T1 – baseline data collection, T2 – immediately after the end of the program, T3 – three month after the end of the program

Self-esteem as a mediator

In the first step, an association between program Unplugged participation and positive self-esteem was tested. The linear regression model was significant ($F=12.601$; $p<0.001$) and explained 13.2 % of variance in the dependent variable. The program Unplugged participation was associated with higher level of positive self-esteem (Table 34). A higher level of positive self-esteem was found between those who participated in the program, between girls and between those, who reported improvement in perceived social, economical status (T1_T2).

Table 34 Association between program Unplugged participation and the positive self-esteem (T3)

	B	S.E.	ß	t	Sig.
Unplugged participation	.993	.495	-.092	-2.005	.046
gender	1.034	.494	.096	2.093	.037
changes in schoool contectedness (T1-T2)	-.080	.050	-.074	-1.610	.108
changes in socio-economic status (T1-T2)	.481	.177	-.125	2.713	.007
positive self-esteem (T1)	.339	.051	.307	6.658	.000

The second step tested the relationship between the program Unplugged participation and the behavioral indicator. The logistic regression model was significant (χ^2=86.31; p<0.001) and explained between 18.7 and 30.6 % variance in the dependent variable. Program Unplugged participation was not associated with the lifetime prevalence of tobacco cigarette smoking (T3; Table 35). Controlled variable – the lifetime prevalence of tobacco cigarette smoking (T1) was significantly associated with the dependent variable.

Table 35 Association between program Unplugged participation and lifetime prevalence of tobacco cigarette smoking (T3)

	B	S.E.	Wald	df	Sig.	OR	95% C.I.	
unplugged particitpation[1]	-.394	.305	1.666	1	.197	.674	.371	1.227
gender[2]	-.376	.300	1.575	1	.210	.686	.381	1.236
changes in socio-economic status(T1_T3)	-.149	.108	1.906	1	.167	.861	.697	1.065
changes in school connectedness (T1_T2)	.016	.031	.255	1	.613	1.016	.956	1.079
lifetime prevalence of cigarettes smoking (T1)	3.598	.467	59.317	1	.000	36.524	14.619	91.248

[1]*Experimental group (1), Control group (0);* [2] *Male (0), Female (1)*

In the third step, an association between program participation and behavioral indicator was tested, when mediator is insterted. The logistic regression model was significant (F=91.09; p<0.001) and explained between 19.7 and 32.3% of variance in the dependent variable. Program Unplugged participation was not

associated with lifetime prevalence of smoking. Positive self-esteem was associated with lifetime prevalence of tobacco cigarette smoking (Table 36). Controlled variable – the lifetime prevalence of tobacco cigarettes smoking (T1) was associated with lifetime prevalence of tobacco cigarette smoking (T3).

Table 36 Association between program Unplugged participation positive self-esteem and lifetime prevalence of tobacco cigarette smoking (T3)

	B	S.E.	Wald	df	Sig.	OR	95% C.I.	
unplugged participation[1]	-.489	.311	2.483	1	.115	.613	.334	1.127
gender[2]	-.308	.304	1.031	1	.310	.735	.405	1.332
changes in socio-economic status(T1_T3)	-.172	.107	2.588	1	.108	.842	.682	1.038
changes in school connectedness (T1_T2)	.012	.031	.156	1	.693	1.012	.953	1.079
lifetime prevalence of cigarettes smoking (T1)	3.616	.472	58.657	1	.000	37.175	14.737	93.777
positive Self-Esteem	-.064	.027	5.456	1	.020	.938	.889	.990

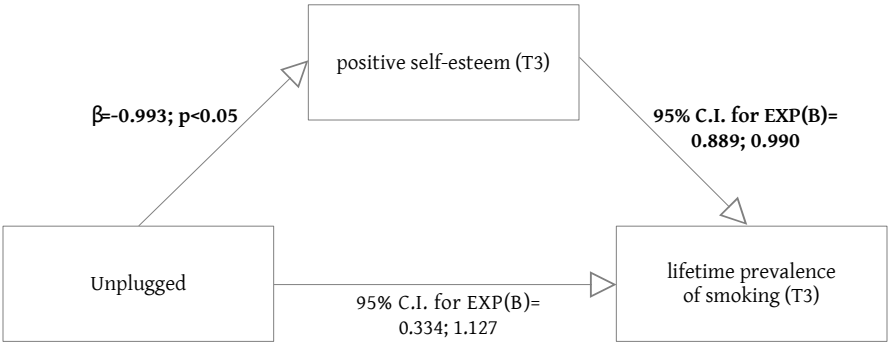
[1]*Experimental group (1), Control group (0);* [2] *Male (0), Female (1)*

The indirect mediation effect (Figure 16) of positive self-esteem was found between program Unplugged participation and lifetime prevalence of tobacco cigarette smoking among friends (T3; z =2.037; p<0.01).

Descriptive normative beliefs as a mediator

In the first step, we explored an association between program Unplugged participation and descriptive normative beliefs. The linear regression model was significant (F=18.38; p<0.001) and explained 18.1% of variance in the dependent variable. The program Unplugged participation was associated with the descriptive normative beliefs about the number of friends who use tobacco cigarettes (Table 37). Controlled variable - descriptive normative beliefs about the number of friends who use tobacco cigarettes (T1) was associated with the dependent variable.

Figure 16 Mediational effect of positive self-esteem in the relationship between program Unplugged participation and lifetime prevalence of tobacco cigarettes smoking



Controlled variables: gender, changes in school connectedness,changes in perceived social-economical status, positive self-esteem (T1), lifetime prevalence of tobacco cigarettes smoking (T1)

Table 37 Association between program Unplugged participation and descriptive normative beliefs about number of friends who use tobacco cigarettes (T3)

	B	S. E.	Beta	t	Sig.
Unplugged participation[1]	-.066	.028	.104	2.346	.019
Gender[2]	-.024	.028	-.038	-.846	.398
Changes in school connectedness (T1_T2)	.004	.003	.069	1.542	.124
Changes in perceived socio-economic status (T1_T3)	.006	.010	.029	.644	.520
Descriptive normative beliefs about number of friends who use cigarettes (T1)	.472	.053	.395	8.839	.000

[1]Experimental group (1), Control group (0); [2] Male (0), Female (1)

The second step of the evaluation of the mediational mechanism, that test the link between the program participation and the behavioral indicator is described in Table 35.

An association between program participation and lifetime prevalence of tobacco cigarettes smoking, when mediator is inserted, was explored in the third step. The logistic regression model was significant (χ^2=110.558; p<0.001) and explained between 23.2 and 38.1% of variance in the dependent variable. The program Unplugged participation was not associated with

lifetime prevalence of tobacco cigarette smoking (Table 38). Descriptive normative beliefs about the number of friends who use tobacco cigarettes (T3) were associated with lifetime prevalence of tobacco cigarette smoking (T3). Controlled variable - lifetime prevalence of tobacco cigarettes smoking (T1) was associated with the dependent variable.

Indirect mediational role of descriptive normative beliefs about the number of friends who use tobacco cigarettes between program Unplugged participation and lifetime prevalence of tobacco cigarette smoking was found ($z=2.12$; $p<0.05$) (Figure 17).

Table 38 Association between program Unplugged participation, descriptive normative beliefs about number of friends who use tobacco cigarettes (T3) and lifetime prevalence of tobacco cigarettes smoking (T3)

	B	S.E.	Wald	df	Sig.	OR	95% C.I.	
unplugged participation[1]	.566	.321	3.111	1	.078	.568	.303	1.065
gender[2]	-.344	.312	1.219	1	.270	.709	.385	1.306
changes in socio-economic status(T1_T3)	-.146	.111	1.725	1	.189	.864	.695	1.074
changes in school connectedness (T1_T2)	-.001	.033	.001	1	.976	.999	.936	1.067
lifetime prevalence of cigarettes smoking (T1)	3.384	.482	49.326	1	.000	29.496	11.471	75.846
descriptive normative beliefs about number of friends who use tobacco cigarettes (T3)	2.343	.486	23.271	1	.000	10.415	4.020	26.984

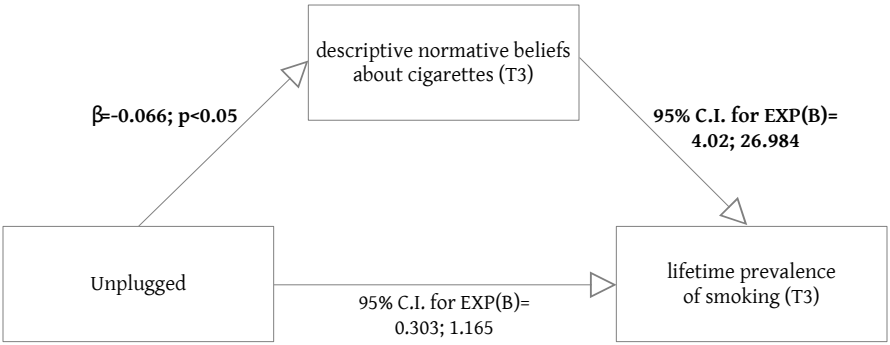
[1]*Experimental group (1), Control group (0);* [2] *Male (0), Female (1)*

Discussion

The aim of this research was to evaluate the effectiveness of the school-based universal prevention program Unplugged with regard to the behavioral outcomes and expected mediators. Sixty elementary schools in Slovakia participated in this research study and were divided into experimental and control groups. Teachers from experimental schools undergone a 3 days interactive training, where they had the opportunity to get familiar with the content of the lessons of the Unplugged program as well as the opportunity to try to conduct these lessons in a group. They also took a test lesson in their schools with 6th grade students (not those that were later participants of the program). Throughout the implementation of the program, communication with the

teachers took place via an online group created specifically for this purpose. After each lesson their task was to complete a sheet containing feedback for every lesson.

Figure 17 Mediational effect of descriptive normative beliefs about number of friends who use tobacco cigarettes in the relationship between program Unplugged participation and lifetime prevalence of tobacco cigarettes smoking



Controlled variables: gender, changes in school connectedness,changes in perceived social-economical status, positive self-esteem (T1), lifetime prevalence of tobacco cigarettes smoking (T1)

In this study, the short term effect of the program on behavioral outcomes and expected mediators was explored. Lifetime prevalence of tobacco cigarette smoking was selected as an indicator of the program effectiveness because these tend to be the substances that are first tried at the early stages of substance use (Kandel, Yamaguchi, 2002). However, no significant effect of this program on tobacco cigarette smoking could be detected. Another examination is needed to evaluate the long term effect of the program. Nevertheless, the obtained results are consistent with other studies (Peterson, Kealy, Mann et al., 2000; Roona, Sterke, Ochshorn et al. 2000) where no prevention programs effect was found with regard to behavioral outcomes. Ellickson and Bell (in Ellicskson et al. 2005) suggest the importance of other types of social influence which may have an impact on the effect of any program. Hawkins, Catalano and Miller (1992) have suggested that effective prevention strategies reduce other risk factors which predict substance use. It must be said that a long term effect of prevention program could be more relevant for program effectiveness evaluation. According to Botvin and Griffin (2007) it is difficult to demonstrate behavioral effects of any

intervention for elementary school students because the baseline rates of use are generally very low. Nevertheless, elementary school youths may benefit from prevention programs that help them to develop strong anti-drug attitudes and establish anti-drug use of norms prior to the years of experimentation.

Expected mediators of the program Unplugged effectiveness were positive self-esteem and descriptive normative beliefs about the number of friends who smoke tobacco cigarettes. The results of this study showed that 3 months after the implementation of the program significant differences between experimental and control group were found in these expected mediators.

The effect of the Unplugged program on expected mediators was further evaluated (Baron Kenny, 1986). Indirect mediation effect of positive self-esteem on lifetime prevalence of tobacco cigarette smoking (T3) was found. The mediation role of positive self-esteem corresponds with the Theory of Problem Behavior (Jessor and Jessor, in Jessor 1987) and the Self-derogation Theory (Kaplan, in Petraitis, Flay, Miller, 1995) which argue that adolescents experience low self-esteem if they repeatedly receive negative evaluations from others and feel deficient in any socially desirable attributes. Generally, people with positive self-views tend to report low levels of substance use (Carvajal et al., 2002).

Although, there is evidence for the opposite as well (Baumeister et al. 2003) and self-esteem has also been considered to be a protective factor against substance abuse. Cast and Burke (2002) consider self-esteem to be a buffer which provides protection from experiences which are potentially harmful. Moreover, alcohol use and the influence of the environment are important with regard to the development and inhibition of self-esteem.

Another indirect mediational effect of descriptive normative beliefs about the number of friends who smoke tobacco cigarettes (3 month after program implementation) was found. Mediation role of normative beliefs in prevention programs has been demonstrated in several studies (Botvin, et al., 2001; Liu et al., 2009; Bate et al., 2009; Sakuma, Sun, Unger et al., 2010; MacKinnon et al., 1991). Prevention programs based on the "social influence model" are the most effective programs which are available (Tobler et al., 2000). Mediation role of positive self-esteem and descriptive normative beliefs about the number of friends who use alcohol and tobacco cigarettes points to the importance of combining effective strategies in order to achieve effectiveness of

prevention programs. Effectiveness of the social influence approach has been demonstrated (Faggiano et al., 2005). Du Bois and Flay (2004) further suggest that for successful health promotion it is important to train self-protective and self-enhancing strategies in groups and via group norms.

Future research

Another important direction of research is the evaluation of so called booster or reinforcement sessions of individual programs, which may increase the effects of prevention depending on specific characteristics of prevention programs (Wiehe, Garrison, Christakis et al., 2005; Botvin et al., 1990; Scheier, Botvin, Griffin et al., 2000; Cuijpers, Jonkers, deWeerdt et al. 2002). Additional potential mediators and moderators of the program related to theoretical background of the program should be considered. For example, evaluation studies bring information about mediational role of knowledge about substances (Lisha et al. 2012), attitudes toward substance use (Liu et al., 2009), beliefs about consequences of addictive substance use and perception of harm (Orlando, Ellickson, McCaffery et al., 2005; Stephens et al 2009), intention to use substances (Stephens et al., 2009), knowledge about behavioral indicators of life skills such as decision making (Bühler et al., 2008; Stephens et al., 2009). In this research, lifetime prevalence of tobacco cigarette smoking was used as an indicator. Further research should be targeted on another indicators as frequency and status of tobacco, alcohol as well as use of other substances.

Limitations

However, this study has also several limitations which should be addressed. The data were collected on a representative sample of adolescents (Baseline: Mage=11.52, SD=0.61) but the results cannot be generalized to other age groups. Other limitations concern the use of questionnaire methods which may have elicited socially acceptable answers. On the other hand, the research confirms the reliability and validity of anonymous "self-report" studies (USGA, 1993; Del Boca, Darces 2003). The source of the data presented in the study was only respondents' answers. Statements about risky behavior of children from other sources, for example teachers and parents, would increase the validity of this research. Single item measure was used for descriptive normative beliefs about the number of friends who use alcohol use and tobacco cigarettes. Multiple item indicators would have been more suitable from the point of view of construct validity. No qualitative data were collected from children about the program implementation. In future research, information from children about their

experience with the program could bring more information about contextual factors that could moderate program effectiveness.

Implications for practice

Results of the evaluation of this prevention program show that the duration of the effect of programs depends on support from environment. According to Swann, Chang, Schneider et al. (2007), changes in self-views require corresponding changes in behaviors and social conditions. Thus producing lasting changes in people's behaviors and social conditions is required for the corresponding changes in self-views (Swann, Chang, Schneider et al., 2007). Parental engagement in school programs also includes communication about school, parents' expectations and domestic rules and practices that could increase effectiveness (Fishel, Ramirez, 2005; Kim, Coutts, Holmes et al. 2012). In this study, part of those adolescents who did not participate in the follow-up testing quit because their parents did not believe in this program. A low trust of parents towards school programs could influence the approach of children to the programs, reception of the program and program effectiveness.

Conclusions

The strengths of the study include the implementation of the Unplugged program and conducting a research on its evaluation with the emphasis on substance use and related variables, with baseline and short term follow-up on a representative sample of early adolescents from 60 schools in different parts of Slovakia. Moreover, the program Unplugged was implemented in full, including training of teachers via 12 lessons as a part of their training. Another evaluation is needed to explore the long term effect of the program.

Conclusion

Many risk factors of health related behavior happen in childhood. The early onset of risk behaviors highlights the importance of early prevention. The main aim of the studies presented in this monograph was to explore individual and interpersonal risk factors of health related behavior among the Slovak early adolescents and to evaluate the school based universal prevention program Unplugged.

The first chapter has contributed to the understanding of correlates of health related behavior, across a broader range of problem behavior in early adolescence. Significant gender differences were found in lifetime prevalence of alcohol consumption, tobacco smoking, excessive computer gaming and fighting at school. In all cases, boys were engaged in more risky behaviors than girls. Among the studied factors, positive expectations of drinking had the strongest association with both alcohol related variables – lifetime prevalence of alcohol consumption and lifetime prevalence of drunkenness. Parental monitoring seemed to be a very important protective factor and was negatively associated with tobacco cigarettes smoking, excessive computer gaming, shoplifting and suicidal attempts. Self-control and emotional regulation were important protective factors of various types of problem behavior such as aggressive behavior – damaging school property and fighting at school, antisocial behavior – shoplifting, trouble with the police and self-destructive behavior such as running from home, having self-harming thoughts and suicidal attempts. Our results further showed that positive attitude toward oneself – self-liking was negatively associated with smoking, fighting at school and all studied types of self-destructive behavior.

The second chapter supports the importance of the specific aspects of self-system regarding the use of legal drugs with respect to gender and age differences. The results showed that legal drug use increased with age and with increasing age of pupils, the use of legal drugs between genders evened. Self-system did not defer in the early adolescent sample but differences were observed in middle adolescent sample with disadvantage for girls. The analysis provide support for the explanatory power of all surveyed variables with respect to the use of legal drugs: self-concept clarity self-liking and self-competence and general self-efficacy were negatively related to legal drugs. Opportunity/refusal skills, social self-efficacy, and negative self-esteem, were positively associated with legal drugs. Positive self-esteem was associated with legal drugs among boys and had negative association with legal drugs among girls.

The aim of *the third chapter* was to explore the associations between parental processes and three types of health risk behavior (alcohol use, smoking and sexual risk behavior) among adolescents. The results showed that parental knowledge was positively associated with parental control and closeness in all three explored types of behaviors. In contrast to parents – child closeness, parental control was not associated with any types of behavior. However, when these relations were mediated trough parental knowledge both processes control and closeness played a protective role with regard to alcohol use and smoking.

The main aim of *the fourth chapter* was to explore whether parental risk behavior is associated with adolescents risk behavior and whether this association can be explained by several mediating variables (indirect effect). The results showed, that in general both paternal and maternal smoking was directly associated with adolescent's smoking. Moreover, indirect association via perceived paternal and maternal approval of adolescents' smoking and via affiliating with smoking friends as mediating variables was confirmed. With regard to parental risk behavior, weekly social drinking had a the strong direct association with adolescents' drinking and was fully mediated by perceived approval of beer drinking and partially mediated by a number of drinking friends. This suggest that it is not the simple fact that parents drink alcohol which increases the probability of adolescent drinking, but rather parental permissiveness of beer drinking (associated with own parental alcohol consumption). Although, increased rules setting was associated with paternal drinking, it did not mediate the relationship between paternal and adolescents' drinking. Paternal drunkenness was not directly associated with adolescents' drunkenness, but an indirect effect via perceived approval and estimated number of drunk friends was found. On the other hand, maternal drunkenness was associated with adolescents' drunkenness. This relationship was explained by perceived approval of drinking and lack of parental knowledge, however, indirect effect of parental support was not confirmed.

In Slovakia, there is a need for the implementation of theory based programs that implement effective strategies and which effectiveness has been evaluated. *The last chapter* therefore aims to evaluate the school-based universal prevention program Unplugged. According to the short-term results the indirect meditational effect of positive self-esteem and normative beliefs about the number of friends who use tobacco cigarettes was found between program participation and lifetime prevalence of tobacco cigarettes smoking. Evaluation of the program Unplugged is based on five data collections. Three of these were used for the analysis and are presented in this monograph. In future research, the results of the remaining two follow-ups will be analyzed and the effect of other potential mediators will be evaluated.

The impact of the program on lifetime prevalence of alcohol use has not been demonstrated, what correspond with the knowledge about the strength of social influence on substance use. As it was shown in another study of this monograph, modelling of parental risk behavior occurs among early adolescents. Parents, however, influence their children's behavior also indirectly via perceived parental approval of risk behavior and affiliating with friends that behave risky. Perceived parental approval in particular, seems to be an important mediator. Within the risk behavior prevention strategies, parents (smoking and drinking parents in particular) should be encouraged to present consistent anti-smoking and anti-drinking attitudes to their adolescent children behavior.

One of the important aims of the research in scientific prevention is the evaluation of the effectiveness of particular programs by identifying the specific mediators, variables through which programs actually operate. We believe that results presented within this monograph add information to existing knowledge about possible mediators. Further research and longitudinal data analyses will help to identify other mediating variables that can be implemented in prevention programs.

We hope, that evaluation of the program Unplugged in Slovakia will lead to further scientific projects, increasing the quality of prevention based on research data in Slovakia.

Zhrnutie

Mnoho rizikových faktorov správania súvisiaceho so zdravím sa objavuje už v detstve. Iniciácia správania ohrozujúceho zdravie, ktorá sa frekventovane vyskytuje už v rannej adolescencii, poukazuje na dôležitosť včasnej prevencie. Cieľom štúdií prezentovaných v tejto monografii bolo preskúmať individuálne a interpersonálne rizikové faktory správania súvisiaceho so zdravím medzi dospievajúcimi na Slovensku a overiť školský program univerzálnej prevencie Unplugged.

Cieľom *prvej kapitoly* bolo popísať koreláty správania súvisiaceho so zdravím u slovenských adolescentov v rámci širšieho spektra problémového správania. Zistené boli významné rodové rozdiely v konzumácii alkoholu, fajčení tabakových cigariet, nadmernom hraní počítačových hier a v prevalencii bitiek v škole. Vo všetkých prípadoch chlapci vykazovali rizikovejšie správanie v porovnaní s dievčatami. Medzi skúmanými faktormi, boli pozitívne predpokladané dôsledky užívania alkoholu najsilnejšie spojené s celoživotnou prevalenciou užívania alkoholu a opitosti. Ako veľmi významným protektívnym faktorom sa ukázal rodičovský monitoring, ktorý bol v negatívnom vzťahu k fajčeniu, nadmernému hraniu PC hier, krádežiam v obchode a suicidiálnym pokusom. Sebakontrola a emocionálna regulácia boli významnými protektívnymi faktormi v prípade viacerých foriem problémového správania, ako je agresívne správanie (poškodzovanie školského majetku, bitky v škole), antisociálne správanie (krádeže v obchode, problémy s políciou) a sebadeštrukčné správanie (úteky z domu, sebapoškodzujúce myšlienky, suicidálne pokusy). Naše výsledky poukázali tiež na to, že pozitívny vzťah k sebe (self-liking) je v negatívnom vzťahu k fajčeniu tabakových cigariet, bitkám v škole a ku všetkým typom sebadeštrukčného správania.

Druhá kapitola podporuje dôležitosť implementácie poznaní o špecifických aspektoch sebasystému vo vzťahu k užívaniu legálnych drog so zreteľom na vekové a rodové odlišnosti. Užívanie legálnych drog vzrastá vekom a vekom má tendenciu sa viac rodovo podobať. Rodovo podobný sebasystém dosahovaný vo veku 11,5 roka sa začína rodovo líši už vo veku 14,7 roka v neprospech dievčat. Potvrdený bol vzťah všetkých sledovaných premenných vo vzťahu k legálnym drogám tj. jasnosť sebapojmu, vedomie vlastnej hodnoty, vedomie vlastnej kompetencie a všeobecná sebaúčinnosť boli v negatívnom vzťahu k užívaniu legálnych drog. Odmietanie/príležitosť cigariet a alkoholu, sociálna sebaúčinnosť a negatívna sebaúcta boli v pozitívnom vzťahu s užívaním legálnych drog. Pozitívna sebaúcta u chlapcov bola tak v pozitívnom ako aj

v negatívnom vzťahu k legálnym drogám, kým pozitívna sebaúcta u dievčat bola v negatívnom vzťahu k užívaniu legálnych drog.

Hlavným cieľom *tretej kapitoly* bolo preskúmať vzťahy medzi rodičovskými procesmi a mierou rizikového správania sa adolescentov. Výsledky poukazujú, že miera informovanosti rodičov je sýtená v rovnakej miere tak priamou rodičovskou kontrolou ako aj blízkosťou vzťahu rodič – dieťa vo všetkých troch skúmaných formách správania. Na rozdiel od blízkosti vzťahu, rodičovská kontrola nebola priamo asociovaná ani s jedným rizikovým spávaním okrem užívania alkoholu. Avšak ak tieto vzťahy boli mediované cez vedomosti rodičov, tak v obidvoch prípadoch, kontrola aj blízkosť mali protektívny vzťah ku miere užívania alkoholu a cigariet.

Hlavným cieľom *štvrtej kapitoly* bolo sledovať možný vzťah medzi rizikovým správaním rodičov a správaním ich školopovinných detí. Ďalej nás zaujímalo, či tento vzťah môže byť vysvetlený prostredníctvom niekoľkých mediujúcich premenných (nepriamy efekt). Výsledky naznačujú, že vo všeobecnosti fajčenie otca i matky priamo súvisí s fajčením ich detí. Zároveň sme potvrdili existenciu nepriameho vzťahu medzi týmito dvoma premennými prostredníctvom percipovaného súhlasu rodičov s fajčením adolescentov a prostredníctvom odhadovaného počtu fajčiacich kamarátov. Spoločenské pitie alkoholu rodičmi takisto úzko súviselo s pitím alkoholu ich detí. Tento vzťah bol však úplne mediovaný prostredníctvom percipovaného súhlasu s pitím piva a čiastočne mediovaný prostredníctvom počtu pijúcich kamarátov. Naše výsledky teda naznačujú, že pravdepodobnosť pitia alkoholu adolescentmi nezvyšuje samotný fakt konzumácie alkoholu rodičmi, ale skôr ich nedostatočne prejavovaný negatívny postoj k pitiu ich detí. Opitosť otca (aspoň raz do mesiaca) nesúvisela s opitosťou adolescenta priamo, len nepriamo prostredníctvom percipovaného súhlasu s pitím piva a odhadovaným počtom priateľov, ktorí sa opijú. V prípade matky, bol tento vzťah potvrdený i priamo. Zaujímavým zistením je, že predpokladaný nepriamy efekt opíjania sa rodičov na opíjanie sa detí prostredníctvom niekoľkých rodičovských charakteristík (konkrétne sociálna opora zo strany rodičov, rodičovský monitoring a stanovovanie pravidiel rodičmi) nebol v našej štúdii potvrdený.

V rámci Slovenska existuje potreba realizácie teoreticky ukotvených programov prevencie, ktoré implementujú efektívne stratégie prevencie a ktorých efektívnosť bola overená. Posledná štúdia sa zameriava na evaluáciu školského programu univerzálnej prevencie Unplugged. Výsledky krátkodobého overovania efektívnosti programu poukázali na nepriamy mediačný efekt sebaúcty a normatívnych presvedčení o počte kamarátov užívajúcich tabakové cigarety vo vzťahu k celoživotnej prevalencii užívania tabakových cigariet. Evaluácia programu Unplugged zahŕňala pre-test a 4 merania od ukončenia programu. Prvé tri vlny zberu dát sú zahrnuté v tejto monografii. Ďalšie

skúmanie bude zamerané na výsledky posledných 2 meraní s dôrazom na overovanie mediačnej roly ďalších premenných.

Naše výsledky nepreukázali vplyv účasti v programe na celoživotnú prevalenciu užívania alkoholu, čo zodpovedá poznatkom o sile sociálneho vplyvu na užívanie návykových látok. Jedna zo štúdii v tejto monografii poukázala na existenciu modelovania rizikového správania rodičov deťmi už v období skorej adolescencie (s výnimkou opitosti otca). Rodičia však môžu ovplyvňovať správanie svojho dieťaťa i nepriamo, prostredníctvom percipovaného súhlasu s rizikovým správaním a prostredníctvom tendencie adolescenta stretávať sa s rizikovo sa správajúcimi priateľmi. V kontexte prevencie rizikového správania sa javí byť obzvlášť dôležitým mediátorom práve adolescentmi percipovaný súhlas rodičov s ich prípadným rizikovým správaním. Je preto veľmi dôležité nabádať rodičov (najmä tých, ktorí sami fajčia a pijú alkohol) k tomu, aby zaujali jednoznačný negatívny postoj voči fajčeniu a pitiu alkoholu svojich detí.

Medzi ciele prevencie založenej na výskumných zisteniach patrí overovanie účinnosti programov a identifikovanie premenných, cez ktoré tieto programy pôsobia. Veríme, že výsledky tejto monografie prispejú k poznatkom o možnom mediačnom pôsobení premenných, ktoré tvoria obsah osnov mnohých programov. Taktiež veríme v to, že projekt overovania efektívnosti programu Unplugged bude viesť k ďalším projektom, ktoré pomôžu zvýšiť kvalitu realizovanej prevencie založenej na výskumných zisteniach na Slovensku.

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