



Relation between resilience and cigarette/alcohol use in adolescents with mild intellectual disability

Odnos između rezilijentnosti i upotrebe cigareta i alkohola kod adolescenata sa intelektualnom ometenošću

Miroslav Pavlović*, Vesna Žunić-Pavlović†, Nenad Glumbić†

*Institute for Improvement of Education, Belgrade, Serbia; University of Belgrade,

†Faculty of Special Education and Rehabilitation, Belgrade, Serbia

Abstract

Background/Aim. Resilience is related to the substance use in adolescence. However, little is known about the nature of this relation in adolescents with intellectual disability (ID). The aim of this research was to determine the relation among three domains of resilience (sense of mastery, sense of relatedness and emotional reactivity) and the substance use (cigarettes, alcohol, and marijuana) in adolescents with ID. **Methods.** The sample consisted of 100 adolescents of both genders with mild ID and aged 13-20 years. The Resiliency Scales for Children and Adolescents were used to assess resilience. **Results.** In the adolescents with ID, resilience was significantly related to the use of cigarettes ($\chi^2 = 13.384$; $df = 3$; $p = 0.004$), but not to the use of alcohol ($\chi^2 = 6.789$; $df = 3$; $p > 0.05$). Out of the three assessed domains of resilience, increased emotional reactivity was the only significant predictor of cigarette use. **Conclusion.** The obtained results suggest that emotional difficulties may increase the risk of cigarette use in adolescents with ID.

Key words:

adolescent; alcohol drinking; intellectual disability; resilience, psychological; smoking.

Apstrakt

Uvod/Cilj. Rezilijentnost je povezana sa upotrebom psihoaktivnih supstanci u adolescenciji, ali malo se zna o prirodi ove veze kod adolescenata sa intelektualnom ometenošću (IO). Cilj istraživanja bio je utvrđivanje povezanosti između tri domena rezilijentnosti (osećanja kontrole nad vlastitim životom, osećanja povezanosti i emocionalne reaktivnosti) i upotrebe cigareta, alkohola i marihuane kod adolescenata sa IO. **Metode.** Uzorak je činilo 100 adolescenata sa IO, oba pola, uzrasta 13–20 godina. Za procenu rezilijentnosti korišćene su Skale rezilijentnosti za decu i adolescente (*Resiliency Scales for Children and Adolescents*). **Rezultati.** Kod adolescenata sa IO rezilijentnost je bila značajno povezana sa upotrebom cigareta ($\chi^2 = 13,384$; $df = 3$; $p = 0,004$), ali ne i sa upotrebom alkohola ($\chi^2 = 6,789$; $df = 3$; $p > 0,05$). Od tri ispitana domena rezilijentnosti, samo je povišena emocionalna reaktivnost bila značajan prediktor upotrebe cigareta. **Zaključak.** Dobijeni rezultati sugerišu da emocionalne teškoće mogu povećati rizik od upotrebe cigareta kod adolescenata sa IO.

Ključne reči:

adolescenti; alkohol, pijenje; intelektualna ometenost; rezilijentnost, psihološka; pušenje.

Introduction

The study of resilience has a relatively long history which began by identifying the characteristics of resilient children, i.e., the characteristics which can account for individual differences in withstanding and recovering from stressful situations¹⁻³. The concept of resilience developed over time, and the attention of researchers was also being directed to understanding the processes which lead to the successful adaptation despite adversity and traumas⁴⁻⁵. Contemporary literature provides an even broader

definition of resilience: “the capacity of dynamic system to withstand or recover from significant threats to its stability, viability or development”⁶. Regardless of the described changes in the conceptualization of resilience, the interest in individual characteristics which contribute to positive developmental outcomes has been sustained up to the present time. According to the authors who follow this course of research, resilience “embodies the personal qualities that enable one to thrive in the face of adversity”⁷. Resilience is believed to be a multidimensional construct which includes some characteristics of temperament

and personality, and also specific skills which enable an individual to successfully overcome life difficulties⁸.

The main focus of this paper are domains of resilience distinguished and described by Prince-Embury⁹: a sense of mastery, sense of relatedness, and emotional reactivity. Sense of mastery includes three individual qualities: optimism as a positive attitude towards the world, one's own life and the future, self-efficacy, i.e., confidence in one's own abilities, and adaptability which involves openness to criticism and the ability to learn from one's own mistakes. Individual qualities included in the sense of relatedness are: a sense of trust, perceived access to support, comfort with others and tolerance of differences. Emotional reactivity includes sensitivity, i.e., speed and intensity of an emotional response and two constructs which represent the outcomes of emotional regulation – recovery and impairment after emotional excitement.

Research on the relation between thus conceptualized resilience and the substance use (SU) in the general population of adolescents reveals that sense of mastery and sense of relatedness negatively correlate, while emotional reactivity positively correlates with the SU¹⁰. Apart from that, literature on the role of described individual qualities of resilience in the occurrence and the development of the SU in typically developing adolescents is extensive. With regard to the sense of mastery, research results suggest that the SU is related to a lower level of self-efficacy^{11–13}, optimism^{14–16} and adaptability^{17–19}. The results of studies on the second domain of resilience, the sense of relatedness, indicate that relationship with parents negatively correlates with the SU^{20–22}, but that relationship with peers may have the opposite effect^{23–25}. Finally, numerous authors associate the SU with emotional reactivity, i.e., with difficulties in experiencing and regulating emotions^{26–28}.

The relation between resilience and the SU in the general population of adolescents has been well researched. However, little attention was given to studying this relation in adolescents with intellectual disability (ID). On the other hand, the results of previous studies have confirmed that many adolescents with ID have experience with the use of cigarettes, alcohol and marijuana.

Some authors found that the prevalence of cigarette use in adolescents with ID is lower compared to the general population^{29–30}. By contrast, the results of some studies showed a higher prevalence of cigarette use in adolescent with ID^{31–32} or absence of significant differences when compared to the general population^{33–34}. Empirical data on the proportion of adolescents with ID who tried cigarettes are not consistent: 3.4%³⁵; 16% of boys and 17% of girls³¹; 30.1%³⁶; 59.5%²⁹. The assessments of the incidence of smoking also differ: 4.9%–26.9% are currently smoking³⁰, i.e., 30%³⁴; 15% smoked more than once, and 14% are currently smoking³²; 27% of boys and 21% of girls smoked during the previous year³¹; 1.4% smoke regularly²⁹.

Older studies reported that the prevalence of alcohol was lower in adolescents with ID than in the general population^{30,37}. However, significant differences related to that were not found in more recent studies^{29,33–34}. The literature provides the following data on the incidence of trying alco-

hol in adolescents with ID: 41%³²; 48%³⁷; 71.7%²⁹. Authors who have dealt with these problems have different observations about the incidence of alcohol use: 22.7%–54.5% consumed alcohol in the previous year³⁰, i.e., 29.5%³⁶; 8.8%–35.5% consumed alcohol in the previous month³⁰, i.e., 39%³⁷; 0.6% drink alcohol regularly³⁵.

It is generally believed that the use of illegal drugs is less prevalent in adolescents with ID than in the general population^{29,33–34,37}. However, the research results indicate that a significant number of adolescents with ID tried marijuana: 10%³⁴; 13%^{33,37}; 34.3%²⁹. Marijuana was used by 0.9%–13.8%³⁰, i.e., 10% of adolescents³⁷ over the previous month, and 1.5%–23.9% during the previous year³⁰.

The aim of this study was to determine the existence and nature of the relations among three domains of resilience (sense of mastery, sense of relatedness, and emotional reactivity) and cigarette, alcohol, and marijuana use in adolescents with ID. With regard to the previous studies, it was assumed that the SU negatively correlated with the sense of mastery and positively with emotional reactivity. However, inconsistent findings on the role of a sense of relatedness did not provide a basis for making initial assumptions about the relation between this domain of resilience and the SU.

Methods

The research was conducted in four schools for students with disabilities in Belgrade. The sample included 100 adolescents with ID, aged 13–20 years [average age: (mean ± standard deviation (SD) = 15.59 ± 1.736 years], of both genders (63% boys and 37% girls). There were no significant differences in the average age of the male and female participants ($t = 0.574$; $df = 98$; $p > 0.05$). The participants' intellectual functioning was at the level of mild ID (IQ = 50–69). The sample included only the adolescents with adequate verbal abilities who were assessed as being able to give answers on a Likert-type scale. The sample did not include the adolescents with dual diagnoses and multiple disabilities.

The data on the participants' age, gender, intellectual functioning, and health were taken from the school records.

The Peabody Picture Vocabulary Scale (PPVT-IV)³⁸ was used for the assessment of participants' verbal abilities. Form A was applied in this research, with 114 items divided into 16 sets which test the knowledge of nouns, verbs, and adjectives from 20 different areas (e.g., plants and professions).

The Youth Risk Behavior Survey (YRBS)³⁹ was used to collect data on the SU. Only the questions from the Scale on the SU related to the history of cigarette use (eight questions), alcohol use (six questions), and marijuana use (four questions) were used in this research. Due to the considerable differences in the responses to questions about the incidence of usage, data on a whole-life prevalence of cigarette, alcohol, and marijuana use were used in the research, and the participants were grouped with regard to whether they had ever used the given psychoactive substances or not. Internal consistency of the scale applied in this research was good ($\alpha = 0.862$).

The Resiliency Scales for Children and Adolescents (RSCA)⁹ were used to assess resilience. The instrument consisted of 64 questions distributed in the following three scales: the Sense of Mastery (MAS) scale consists of Optimism, Self-efficacy and Adaptability subscales; the Sense of Relatedness (REL) scale consists of the Sense of Trust, Perceived Access to Support, Comfort with Others and Tolerance of Differences subscales; the Emotional Reactivity (REA) scale consists of Sensitivity, Recovery and Impairment subscales. The higher scores on the MAS and REL scales and the lower scores on the REA scale point to greater resilience. Internal consistency of the RSCA ($\alpha = 0.894$) as well as the MAS ($\alpha = 0.820$), the REL ($\alpha = 0.880$) and the REA ($\alpha = 0.924$) scales was good in this research.

The informed consent was obtained from the school, parents and participants for the purpose of this research. Class teachers selected students with adequate verbal abilities who were able to participate in the research. Also, before giving out the questionnaires, the assessment of receptive speech was conducted by means of the PPVT-IV. The participants achieved standard scores in the range 94–185 (mean \pm SD = 135.61 \pm 22.861). The research aims were explained and instructions on data collecting procedure were given to each participant. The participants were informed that participation in the research was voluntary and that their responses were confidential. The questionnaires were completed in a separate room in the school, without the presence of anybody else but the examiner and participants. The questions were read as they were given in questionnaires, with necessary additional explanations. The participants were required to choose one of the given answers. Cards with provided answers were made in order to make it easier for the participants to answer the questions.

Descriptive statistics, correlation method, and regression analysis (binary logistic analysis) were used in data analysis.

Results

Out of 100 participants, a total of 49% reported cigarette use, 63% reported alcohol use and 4% reported marijuana use at least once in their lifetime.

Table 1 includes data on the range, mean, and SD of the raw scores for the MAS, REL, and REA scales and their subscales.

Table 1
Descriptive measures of scores on the Resiliency Scales for Children and Adolescents (RSCA)

RSCA scales and subscales	Range min–max	Mean \pm SD
MAS	31–73	50.83 \pm 8.016
optimism	10–25	17.37 \pm 3.569
self-efficacy	9–36	23.98 \pm 5.077
adaptability	1–12	9.48 \pm 1.801
REL	40–96	71.34 \pm 10.050
sense of trust	10–28	20.65 \pm 3.273
perceived access to support	10–24	19.64 \pm 2.830
comfort with others	6–16	11.46 \pm 2.298
tolerance of differences	10–28	19.59 \pm 3.822
REA	0–66	33.17 \pm 13.761
sensitivity	0–22	11.94 \pm 4.397
recovery	0–16	5.41 \pm 3.015
impairment	0–38	15.82 \pm 8.402

MAS – mastery; REL – relatedness; REA – reactivity; SD – standard deviation; min – minimum; max – maximum.

The relation between the main variables was tested by means of the correlation method. Table 2 shows the values of the Pearson's correlation coefficient. Cigarette use had a statistically significant positive correlation with the scores on the Adaptability subscale, the REA scale and its subscales – Sensitivity, Recovery and Impairment. Alcohol use had a statistically significant positive correlation with the scores on the REA scale and its Sensitivity and Impairment subscales and a negative correlation with the scores on the Optimism subscale. There were no significant correlations between marijuana use and the scores on the Resiliency Scales for Children and Adolescents.

The relation between resilience and cigarette/alcohol use was assessed by a series of binary logistic analyses. The binary logistic analyses were not performed for marijuana use, since very few of the participants stated that they had tried marijuana (4 out of 100 participants) and there were no significant correlations.

Table 2
Correlations between scores on the Resiliency Scales for Children and Adolescents (RSCA) and cigarette, alcohol and marijuana use

RSCA scales and subscales	Cigarettes	Alcohol	Marijuana
MAS	0.028	-0.105	0.171
optimism	-0.085	-0.200*	0.180
self-efficacy	0.032	-0.007	0.102
adaptability	0.206*	-0.049	0.116
REL	-0.043	-0.024	0.044
sense of trust	0.030	0.000	0.053
perceived access to support	0.019	-0.120	0.026
comfort with others	0.074	0.136	0.071
tolerance of differences	-0.147	-0.055	0.009
REA	0.352 [†]	0.218*	0.027
sensitivity	0.292 [†]	0.198*	0.003
recovery	0.233*	0.132	0.040
impairment	0.339 [†]	0.206*	0.029

* $p < 0.05$; [†] $p < 0.01$.

For other abbreviations see under Table 1.

Table 3

Characteristics of the resilience dimensions as predictors in regression model

RSCA scales	B	S.E.	Wald	df	<i>p</i>	Exp(B)
MAS	0.002	0.030	0.007	1	0.936	1.002
REL	-0.010	0.024	0.177	1	0.674	0.990
REA	0.059	0.018	10.741	1	0.001	1.060

For abbreviations see under Table 1.

The results of binary logistic analyses indicated that participants' resilience was related to cigarette use ($\chi^2 = 13.384$; $df = 3$; $p = 0.004$), with the achieved scores on REA scale being singled out as the only significant predictor (Table 3). By contrast, the assessed dimensions of resilience (MAS, REL, and REA) were not significant predictors of alcohol use ($\chi^2 = 6.789$; $df = 3$; $p > 0.05$).

The second series of binary logistic analyses assessed the predictive value of scores achieved on the subscales of MAS (Optimism, Self-efficacy and Adaptability), the subscales of REL scale (Sense of Trust, Perceived Access to Support, Comfort with Others and Tolerance of Differences) and the subscales of REA scale (Sensitivity, Recovery and Impairment). The achieved scores on the mentioned subscales were not the significant predictors either of cigarette use ($\chi^2 = 17.955$; $df = 10$; $p = 0.056$) or alcohol use ($\chi^2 = 13.841$; $df = 10$; $p = 0.180$).

Discussion

Although the prevalence of the SU in adolescents with ID is not the subject of this study, the obtained results deserve a brief comment. The incidence of cigarette and alcohol use was higher when compared to the results of other studies conducted on the samples of adolescents with ID in the USA³⁰, Great Britain^{31–32, 34, 36} and Taiwan³⁵ and lower when compared to the empirical data from South Africa²⁹. However, the incidence of marijuana use was significantly lower when compared to the results of studies conducted in other countries^{29–30, 33–34, 37}.

This research analyzed the relation among three domains of resilience and cigarette, alcohol, and marijuana use in the adolescents with ID. Compared to the normative population, 9 the participants' scores on the MAS scale were below the average range, in the average range on the REL scale and above the average range on the REA scale. The most important findings indicated that the sense of mastery and sense of relatedness were not significantly related to the SU while emotional reactivity was.

Contrary to our expectations, a negative correlation between the sense of mastery and the SU was not confirmed. A very low positive correlation was determined between Adaptability and cigarette use. This finding may be compared to observations of other authors who found that, in the population of people with ID, smoking had a higher incidence in those with developed adaptive skills^{40–42}, and that cigarette use was a symbol of maturity and competence⁴³, or a means to blend in⁴⁴. Also, a very low negative correlation was determined between Optimism and alcohol use, which is in accordance with the results of the previously mentioned

studies indicating that adolescents who had more positive expectations of the future used alcohol less frequently^{14–16}. When interpreting the results on the relation between sense of mastery and the SU, we should bear in mind that the participants generally had the scores below average on the MAS scale. Thus, it is possible that the applied instrument was not sensitive enough to detect subtle individual differences in the adolescents with ID.

The absence of significant correlations between the sense of relatedness and the SU was somewhat expected. As already mentioned, the results of the previous studies suggested that the nature of this relation varied depending on whether the relationship was with parents or with peers. The questions referring to the relationships with parents and peers were not separated in the REL scale which could have influenced the obtained results.

The results of this research indicated that emotional reactivity was a significant predictor of cigarette use in the adolescents with ID. In generally sparse literature on the SU in adolescents with ID, the studies on the relation between the SU and emotional difficulties are quite rare. However, although scarce, the existing studies on the risk factors of the SU in the adolescents with ID suggest that the mental health problems have a particularly important role^{36, 45–47}.

The obtained results are in accordance with the results of numerous studies which point to a significant relation between the SU and emotional difficulties in the general population of adolescents. The authors who researched the relation between negative emotions and the SU were consistently finding that adolescents with higher negative affectivity used substances more frequently to overcome, or alleviate unpleasant emotions^{28, 48–49}. The conclusions of the study which summarized the results of relevant research in this field emphasized that apart from negative affectivity, higher positive affectivity and poor regulation of emotions also had a significant role in initiation of the SU⁵⁰. In other words, intensive emotional states, oversensitivity to emotional stimuli, and inability to control emotions increased the risk of the SU in adolescence. Empirical data on frequent co-morbidity of the SU and depression and anxiety disorders in adolescence^{26, 51–52} should also be mentioned. The literature related to this subject shows that the prevalence of co-morbidity of the SU and depression ranges from 11.1% to 32%, and of the SU and anxiety disorders from 7% to 40.4%⁵³ in adolescents.

According to the results of this research, emotional reactivity was significantly related to cigarette use, but not to alcohol use. A stronger connection of the emotional difficulties with cigarette use than with alcohol use was also confirmed in the studies conducted on samples of typically developing adolescents²⁶ and adolescents with ID³².

The relation between cigarette use and emotional difficulties in the general population of adolescents has a good empirical basis, and research results on this subject were summed up in several reviews of the relevant literature⁵⁴⁻⁵⁶. A common conclusion of these studies is that emotional difficulties increase the risk of cigarette use in adolescence. The results of this research are supported by the empirical data on a higher incidence of cigarette use in adolescents with ID and the mental health problems³².

The relation between emotional difficulties and the SU can be explained by self-medication hypothesis which implies that the SU functions as a compensatory means for modulating negative emotions and alleviating unpleasant psychological states⁵⁷. According to this hypothesis, the choice of psychoactive substances depends on the type of internal difficulties a person feels and physiological and psychological effects of the given substances. With regard to cigarette use, adolescents usually justify smoking by sedative and anxiolytic effects of nicotine, and suggest that the need for relaxation and stress reduction are their motives for cigarette use⁵⁵. The observation of some authors is particularly interesting. According to them, the effects which adolescents experience when first consuming cigarettes influence their smoking later in a way that regular smoking is more frequent in those who experience more positive and fewer negative effects⁵⁸.

An explanation of the obtained results may also be sought in the motivational model of alcohol use in adolescence, according to which one of the motives is a desire or a need to avoid or alleviate unpleasant emotional experiences⁵⁹. This motive is considered to be an intermediary in the relation between negative emotions and the SU²⁸. In this case, the SU represents a reactive process preceded by experiencing negative emotions and may be related to the symptoms of anxiety⁶⁰ and depression⁴⁹. A similar pattern was determined in one of the few studies on how to cope with the stress strategies in persons with ID who used substances⁶¹. The authors of this research reported that persons with ID who used substances were prone to a "palliative" pattern of reacting to stress, i.e., that they had poorer skills of relaxing and engaging in other activities when they were in stressful situations. The research in which the mentioned motivational model was applied to cigarette use showed that adolescents with increased anxiety were particularly prone to cigarette use, motivated by avoiding unpleasant emotions because of anxiolytic effects of nicotine⁶⁰.

The influence of emotional difficulties on the SU varies depending on the presence of other risk factors. With regard to that, special attention was given to the influence of peer groups and empirical findings confirmed that the relation between negative emotions and the SU increased by socializing with peers who used psychoactive substances²⁷. The SU is more available in such an environment, while alternative activities and interactions which may help overcome negative emotions are highly limited⁴⁸. Although this research did not include the characteristics of friendly relationships, it is reasonable to assume that education in a restrictive environment, consisting exclusively of peers with ID, does not provide enough possibilities to learn effective emotion regulating strategies.

The literature discusses the possibility that emotional difficulties and the SU have a common etiology in genetic influences and environmental factors⁶². This viewpoint is supported by empirical data on higher incidence of the SU in adolescents with a family history of substance abuse⁵⁰.

Finally, many authors believe that the relation between the SU and emotional difficulties is two-way, i.e., that the emotional difficulties may have a role of a risk factor or a consequence, depending on the phase of using psychoactive substances. The increased level of the emotional difficulties increases the risk of initiation and experimental use of psychoactive substances, but the regular SU contributes to emotional difficulties⁵⁰. Cigarette use may contribute to an increased level of stress and negative affectivity⁵⁴⁻⁵⁶ and proved to be a more significant predictor of severe symptoms of depression in adolescents than alcohol use^{62, 63}.

This study has certain limitation that need to be mentioned. First of all, attention was directed to the individual qualities which represented only one aspect of a complex resilience construct. Future research should be aimed at environmental influences and the interaction of the individual and environmental factors. Second, only data obtained from the adolescents with ID were used. Thus, different sources of information, methods and instruments should be used for assessing resilience and the SU in the future. Third, the research does offer a possibility to draw conclusions on causal relations between the assessed variables which points to the need for longitudinal research of this subject.

Despite the mentioned limitations, the findings of this study provided a significant insight into insufficiently researched relation between the SU and a sense of mastery, sense of relatedness, and emotional reactivity in adolescents with ID.

Identification of factors which contribute to the SU in adolescence has important implications for prevention. The results of this research suggest that the attention should be directed to the emotional difficulties which increase the risk of SU in adolescents with ID. Alleviating emotional difficulties may be a strong motivating factor for the SU and may increase adolescents' susceptibility to negative influences of peers and the media. Therefore, in preventing the SU in adolescents with ID, priority should be given to interventions aimed at improving self-control and emotion regulation as well as learning effective strategies to overcome negative emotions and stress. Bearing in mind the data on the incidence of cigarette and alcohol use in adolescents with ID, these interventions should be applied to a universal level, through organized curricular and extracurricular activities for all students.

Conclusion

The results of this research may contribute to understanding the relation between individual qualities of resilience and the SU in adolescents with ID. The obtained findings with a significant predictive value of emotional reactivity complement the extensive literature on the relation between the emotional difficulties and the SU in adolescence. Future research should be aimed at studying mechanisms underlying this relation.

Acknowledgement

This paper is a result of the project Social Participation of Persons with Intellectual Disability, No. 179017 (2011–

2019) funded by the Ministry of Education, Science and Technological Development of the Republic of Serbia.

R E F E R E N C E S

1. *Garmezy N, Masten AS, Tellegen A.* The study of stress and competence in children: a building block for developmental psychopathology. *Child Dev* 1984; 55(1): 97–111.
2. *Rutter M.* Resilience in the face of adversity. Protective factors and resistance to psychiatric disorder. *Br J Psychiatr* 1985; 147(6): 598–611.
3. *Werner EE.* Resilient children. *Young Children* 1984; 40(1): 68–72.
4. *Luthar SS, Cicchetti D, Becker B.* The Construct of Resilience: A Critical Evaluation and Guidelines for Future Work. *Child Dev* 2000; 71(3): 543–62.
5. *Masten AS, Best KM, Garmezy N.* Resilience and development: Contributions from the study of children who overcome adversity. *Dev Psychopathol* 1990; 2(4): 425–44.
6. *Masten AS.* Resilience in children threatened by extreme adversity: Frameworks for research, practice, and translational synergy. *Dev Psychopathol* 2011; 23(2): 141–54.
7. *Connor KM, Davidson JR.* Development of a new resilience scale: The Connor-Davidson Resilience Scale (CD-RISC). *Depress Anxiety* 2003; 18(2): 76–82.
8. *Campbell-Sills L, Cohan SL, Stein MB.* Relationship of resilience to personality, coping, and psychiatric symptoms in young adults. *Behav Res Ther* 2006; 44(4): 585–99.
9. *Prince-Embury S.* Resiliency Scales for Children and Adolescents: A profile of personal strengths. San Antonio, TX: Hartcourt Assessment; 2007.
10. *Prince-Embury S.* Assessing personal resiliency in the context of school settings: Using the Resiliency Scales for Children and Adolescents. *Psychol Schools* 2011; 48(7): 672–85.
11. *Allen JP, Leadbeater BJ, Aber J.* The relationship of adolescents' expectations and values to delinquency, hard drug use, and unprotected sexual intercourse. *Dev Psychopathol* 1990; 2(1): 85–98.
12. *Caputo RK.* The effects of socioeconomic status, perceived discrimination and mastery on health status in youth cohort. *Soc Work Health Care* 2003; 37(2): 17–42.
13. *Ludwig KB, Pittman JF.* Adolescent Prosocial Values and Self-Efficacy in Relation to Delinquency, Risky Sexual Behavior, and Drug Use. *Youth Soc* 1999; 30(4): 461–82.
14. *Carvajal SC, Evans RI, Nash SG, Getz GJ.* Global positive expectancies of the self and adolescents' substance use avoidance: Testing a social influence mediational model. *J Pers* 2002; 70(3): 421–42.
15. *Patton GC, Tollit MM, Romaniuk H, Spence SH, Sheffield J, Sanyer MG.* A prospective study of the effects of optimism on adolescent health risks. *Pediatrics* 2011; 127(2): 308–16.
16. *Wray TB, Dvorak RD, Hsia JF, Arens AM, Schweinle WE.* Optimism and pessimism as predictors of alcohol use trajectories in adolescence. *J Child Adoles Subst* 2013; 22(1): 58–68.
17. *Ammerman RT, Lynch KG, Donovan JE, Martin CS, Maisto SA.* Constructive thinking in adolescents with substance use disorders. *Psychol Addict Behav* 2001; 15(2): 89–96.
18. *Griffin KW, Scheier LM, Botvin GJ, Diaz T.* Protective role of personal competence skills in adolescent substance use: Psychological well-being as a mediating factor. *Psychol Addict Behav* 2001; 15(3): 194–203.
19. *Jaffee WB, D'Zurilla TJ.* Personality, problem solving, and adolescent substance use. *Behav Ther* 2009; 40(1): 93–101.
20. *Schindler A, Thomasius R, Sack P, Gemeinhardt B, Küstner U, Eckert J.* Attachment and substance use disorders: A review of the literature and a study in drug dependent adolescents. *Attach Hum Dev* 2005; 7(3): 207–28.
21. *Turner RA, Irwin CE, Tschann JM, Millstein SG.* Autonomy, relatedness, and the initiation of health risk behaviors in early adolescence. *Health Psychol* 1993; 12(3): 200–8.
22. *Wills TA, Cleary SD.* How are social support effects mediated? A test with parental support and adolescent substance use. *J Pers Soc Psychol* 1996; 71(5): 937–52.
23. *Bond L, Butler H, Thomas L, Carlin J, Glover S, Bowes G, et al.* Social and school connectedness in early secondary school as predictors of late teenage substance use, mental health, and academic outcomes. *J Adolesc Health* 2007; 40(4): 357.e9–18.
24. *Scholte RH, van Lieshout CF, van Aken MA.* Perceived Relational Support in Adolescence: Dimensions, Configurations, and Adolescent Adjustment. *J Res Adolesc* 2001; 11(1): 71–94.
25. *Wills TA, Resko JA, Ainette MG, Mendoza D.* Role of parent support and peer support in adolescent substance use: A test of mediated effects. *Psychol Addict Behav* 2004; 18(2): 122–34.
26. *Kandel DB, Johnson JG, Bird HR, Canino G, Goodman SH, Lahey BB, et al.* Psychiatric disorders associated with substance use among children and adolescents: Findings from the Methods for the Epidemiology of Child and Adolescent Mental Disorders (MECA) Study. *J Abnorm Child Psychol* 1997; 25(2): 121–32.
27. *Shoal GD, Giancola PR.* Negative affectivity and drug use in adolescent boys: Moderating and mediating mechanisms. *J Pers Soc Psychol* 2003; 84(1): 221–33.
28. *Wills TA, Sandy JM, Shinar O, Yaeger A.* Contributions of positive and negative affect to adolescent substance use: Test of a bidimensional model in a longitudinal study. *Psychol Addict Behav* 1999; 13(4): 327–38.
29. *Fakier N, Wild LG.* Associations among sleep problems, learning difficulties and substance use in adolescence. *J Adolesc* 2011; 34(4): 717–26.
30. *Gress JR, Boss MS.* Substance abuse differences among students receiving special education school services. *Child Psychiatry Hum Dev* 1996; 26(4): 235–46.
31. *Emerson E, Baines S, Allerton L, Welch V.* Health inequalities and people with learning disabilities in the UK: 2011. Durham, UK: Learning Disabilities Observatory; 2011.
32. *Emerson E, Turnbull L.* Self-reported smoking and alcohol use among adolescents with intellectual disabilities. *J Intellect Disabil* 2005; 9(1): 58–69.
33. *Chapman SL, Wu LT.* Substance abuse among individuals with intellectual disabilities. *Res Dev Disabil* 2012; 33(4): 1147–56.
34. *Taggart L, Cousins V, Milner S.* Young people with learning disabilities living in state care: Their emotional, behavioural, and mental health status. *Child Care Pract* 2007; 13(4): 401–16.
35. *Yen CF, Lin JD.* Factors for healthy food or less-healthy food intake among Taiwanese adolescents with intellectual disabilities. *Res Dev Disabil* 2010; 31(1): 203–11.
36. *Taggart L, Taylor D, McCrum-Gardner E.* Individual, life events, family and socio-economic factors associated with young people with intellectual disability and with and without behavioural/emotional problems. *J Intellect Disabil* 2010; 14(4): 267–88.

37. *Pack RP, Wallander JL, Bronne D.* Health risk behaviors of African American adolescents with mild mental retardation: Prevalence depends on measurement method. *Am J Ment Retard* 1998; 102(4): 409–20.
38. *Dunn LM, Dunn DM.* Peabody Picture Vocabulary Test. Minneapolis, MN: NCS Pearson, Inc.; 2007.
39. Centers for Disease Control and Prevention - CDC. State and Local Youth Risk Behavior Survey. 2011. Available from: http://www.cdc.gov/healthyyouth/yrbs/pdf/questionnaire/2011_hs_questionnaire.pdf
40. *McGuire BE, Daly P, Smyth F.* Lifestyle and health behaviours of adults with an intellectual disability. *J Intellect Disabil Res* 2017; 51(7): 497–510.
41. *Robertson J, Emerson E, Gregory N, Hatton C, Turner S, Kessissoglou S, et al.* Lifestyle related risk factors for poor health in residential settings for people with intellectual disabilities. *Res Dev Disabil* 2000; 21(6): 469–86.
42. *van Duijvenbode N, Didden R, Bloemsaat G, Engels RC.* Problematic alcohol use and mild intellectual disability: Standardization of pictorial stimuli for an alcohol cue reactivity task. *Res Dev Disabil* 2012; 33(4): 1095–102.
43. *Hymowitz N, Jaffe FE, Gupta A, Feuerman M.* Cigarette smoking among patients with mental retardation and mental illness. *Psychiat Serv* 1997; 48(1): 100–2.
44. *Cocco KM, Harper DC.* Substance Use in People with Mental Retardation: A Missing Link in Understanding Community Outcomes. *Rehabil Couns Bull* 2002; 46(1): 33–40.
45. *Santosh PJ, Mijovic A.* Does pervasive developmental disorder protect children and adolescents against drug and alcohol use?. *Eur Child Adolesc Psychiatry* 2006; 15(4): 183–8.
46. *Slyter EM.* Not immune: Access to substance abuse treatment among Medicaid-covered youth with mental retardation. *J Disabil Policy Stu* 2010; 20(4):195-204.
47. *Van der Nagel J, Kiewik M, Buitelaar J, de Jong C.* Staff perspectives of substance use and misuse among adults with intellectual disabilities enrolled in Dutch disability services. *J Policy Pract Intel* 2011; 8(3): 143–9.
48. *Hussong AM, Hicks RE.* Affect and peer context interactively impact adolescent substance use. *J Abnorm Child Psychol* 2003; 31(4): 413–26.
49. *Willem L, Bijttebier P, Claes L, Uytterhaegen A.* Temperament and problematic alcohol use in adolescence: An examination of drinking motives as mediators. *J Psychopathol Behav* 2012; 34(2): 282–92.
50. *Cbeetham A, Allen NB, Yücel M, Lubman DI.* The role of affective dysregulation in drug addiction. *Clin Psychol Rev* 2010; 30(6): 621–34.
51. *Merikangas KR, Mehta RL, Molnar BE, Walters EE, Swendsen JD, Aguilar-Gasziola S, et al.* Comorbidity of substance use disorders with mood and anxiety disorders: Results of the International Consortium in Psychiatric Epidemiology. *Addict Behav* 1998; 23(6): 893–907.
52. *Roberts RE, Roberts CR, Xing Y.* Comorbidity of substance use disorders and other psychiatric disorders among adolescents: Evidence from epidemiologic study. *Drug Alcohol Depen* 2007; 88(Suppl 1): S4–13.
53. *Armstrong TD, Costello J.* Community studies on adolescent substance use, abuse, or dependence and psychiatric comorbidity. *J Consult Clin Psychol* 2002; 70(6): 1224–39.
54. *Gebrieke JG, Loughlin SE, Whalen CK, Potkin SG, Fallon JH, Janner LD, et al.* Smoking to self-medicate attentional and emotional dysfunctions. *Nicotine Tob Res* 2007; 9(Suppl 4): S523–36.
55. *Kassel JD, Stroud LR, Paronis CA.* Smoking, stress, and negative affect: Correlation, causation, and context across stages of smoking. *Psychol Bull* 2003; 129(2): 270–304.
56. *Morissette SB, Tull MT, Gulliver SB, Kambolç BW, Zimering RT.* Anxiety, anxiety disorders, tobacco use, and nicotine: A critical review of interrelationships. *Psychol Bull* 2007; 133(2): 245–72.
57. *Khantzian EJ.* Understanding addictive vulnerability. *Neuropsychanalysis* 2003; 5(1): 5–21.
58. *Eissenberg T, Balster RL.* Initial tobacco use episodes in children and adolescents: Current knowledge, future directions. *Drug Alcohol Depen* 2000; 55(1): 41–60.
59. *Cooper M.* Motivations for alcohol use among adolescents: Development and validation of a four-factor model. *Psychol Assess* 1994; 6(2): 117–28.
60. *Comeau N, Stewart SH, Loba P.* The relations of trait anxiety, anxiety sensitivity, and sensation seeking to adolescents' motivations for alcohol, cigarette, and marijuana use. *Addict Behav* 2001; 26(6): 803–25.
61. *Didden R, Embregts P, van der Toorn M, Laarhoven N.* Substance abuse, coping strategies, adaptive skills and behavioral and emotional problems in clients with mild to borderline intellectual disability admitted to treatment facility: A pilot study. *Res Dev Disabil* 2009; 30(5): 927–32.
62. *Poulin C, Hand D, Boudreau B, Santor D.* Gender differences in the association between substance use and elevated depressive symptoms in a general adolescent population. *Addiction* 2005; 100(4): 525–35.
63. *Waller MW, Hallfors DD, Halpern CT, Iritani BJ, Ford CA, Guo G.* Gender differences in associations between depressive symptoms and patterns of substance use and risky sexual behavior among a nationally representative sample of U.S. adolescents. *Arch Women Ment Health* 2006; 9(3): 139–50.

Received on April 8, 2017.
Accepted on May 18, 2017.
Online First May, 2017.