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Original research paper

THE CORRELATION BETWEEN TRAUMATIC EXPERIENCES AND PSYCHOACTIVE SUBSTANCE USE AMONG ADOLESCENTS: IMPLICATIONS FOR EDUCATIONAL PRACTICE

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A B S T R A C T

Despite its importance, childhood trauma is often not recognized as a pathogenic fact that affects the (de)formation of personality and influences the development of various psychological difficulties and bad habits, including the likelihood of future psychoactive substance abuse. This study aimed to examine the relationship between adverse childhood experiences and substance misuse in adolescence. The research was conducted on a sample of 380 secondary

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school students (aged 14 to 19 years) from Vojvodina. The questionnaires used included: the Questionnaire of Sociodemographic Characteristics and Psychoactive Substance Uses, which was designed for the purpose of this research, and the Childhood Trauma Questionnaire (CTQ, Bernstein & Fink, 1998). The research employed the methods of descriptive statistics, Spearman's correlation coefficient, and the chi-squared test. A total of 10.2% of respondents used psychoactive substances less than once a week, 3.2% used psychoactive substances once a week, and 1.8% used psychoactive substances every day. In terms of traumatic experiences, only 6.6% of respondents reported having no or minimal trauma, the majority (62.9%) had a low-to-moderate level of traumatization, while nearly one in three respondents (30.5%) exhibited a moderate-to-severe or severe-to-extreme level of traumatization. A significant correlation was found between the intensity of each form of traumatization and the frequency of psychoactive substance use, with the correlations being most pronounced for emotional abuse ($r = .38$), sexual abuse ($r = .35$), and total traumatization ($r = .34$). The results highlight the importance of preventing drug abuse in the student population, as well as the need to sensitize and educate teachers and school counselors to ensure the timely recognition of traumatization in adolescents, and help prevent or mitigate psychoactive substance use problems and other mental health issues.

Key words:

adolescence, trauma, abuse, psychoactive substances, prevention.

■ INTRODUCTION

The Concept of Trauma

Every event that is psychologically overwhelming, difficult, disturbing, or frightening is generally referred to as trauma. To determine what can be labeled as trauma, it is crucial to examine factors such as the quality and intensity of the traumatizing event, its effect on the entire human organism, and most importantly, individual coping strategies and capacities (Backović, Maksimović, & Stevanović, 2007). According to the DSM-5 classification of mental disorders (*American Psychiatric Association*, 2014), a traumatic experience involves exposure to actual or threatened death, serious injury, or sexual violence. The consequences of such an event involve a sense of horror, helplessness, and absence of meaning and impaired functioning in social relations, at work, and in other important aspects of life. The classification highlights four forms of trauma exposure: 1) directly experiencing a traumatic event; 2) personally witnessing a traumatic event as it occurred to others; 3) learning that such an event occurred to a family member or close friend; and 4) immediate exposure to aversive details of another person's traumatic experience (Protić, 2016).

One of the primary characteristics of trauma is that it is an event over which the person has no control and one that constitutes a serious threat to the individual's

physical and psychological integrity. Traumatization occurs when the coping strategies that proved helpful in the past are no longer effective. The organism becomes overwhelmed, the balance is disturbed, and the person is overcome with subjective feelings of helplessness, submission, pain, confusion, and a sense of being threatened. Since these feelings affect the functioning of the nervous and endocrine systems, they can lead to permanent and significant changes in memory, thinking, and activity levels (Backović et al., 2007; Mogyorósy-Révész, 2019).

Exposure to Trauma in Childhood and Adolescence

The age at which trauma is experienced is as important as the nature of the event itself. In adulthood, traumatic events affect the structured, already-formed personality, while childhood trauma affects the personality while it is in the process of development (Perry & Szalavitz, 2017). Developmental trauma can be defined as a stressful life experience involving physical, emotional, sexual abuse/harassment or other traumatic experiences during childhood or adolescence that impede healthy development. Developmental trauma differs from one-time, acute forms of trauma as it constitutes chronic/recurrent trauma occurring during childhood and in the context of the child's relationships with other persons (van der Kolk, 2009; Cruz et al., 2022). Such pervasive developmental traumatization can result in personality deformations and significant difficulties in establishing stable interpersonal relationships over the lifespan (van der Kolk, 2007).

In the case of physical abuse, the physical integrity of the child/young person is threatened or violated (e.g., by striking or pushing). Children who are emotionally abused are humiliated, shamed, called names, and made to believe that they are useless, worthless, and undeserving of love. Sexual abuse has a wide range of meanings. It is not merely limited to the act of penetration but encompasses other sexual activities and even what is referred to as contactless experiences, during which children are exposed to sexual content or activities that are not appropriate for their age and level of development. Neglect refers to the failure of the caretaker to provide the care necessary for the child's healthy development. The child grows up emotionally deprived, bereft of the love of a caring adult, or suffering because of unmet physical needs (Pejović Milovančević et al., 2012; Ujhelyiné-Nagyésés & Kuritárné-Szabó, 2020). The concept of *traumatization* refers to the mechanism of the action of harmful events, since childhood trauma affects the process of personality development and maturation, and irreversibly alters the child's developmental path (Cruz et al., 2022). The consequences of chronic and complex (combined presence of multiple forms of trauma) traumatization have the most profound impact on a developing personality and the most dire consequences for both physical and mental health (van der Kolk, 2009; Cruz et al., 2022; Webster, 2022). Apart from abuse and neglect, harmful childhood experiences include different forms of family dysfunction, including

cohabitation with a drug user or a family member with mental health problems, crime in the family, and witnessing or directly observing family violence or abuse (UNICEF, 2019; Ujhelyiné-Nagy & Kuritárné-Szabó, 2020).

Clinical observations have revealed some of the most common characteristics of traumatized children: 1) vivid, intrusive, and recurrent memories of the traumatic event; 2) repetitive behaviors; 3) intense fears; and 4) altered views and attitudes about people, life, and the future, that is, the symptoms of posttraumatic stress disorder (Cruz et al., 2022; Protić, 2016). Exposure to childhood trauma affects brain development over time and leads to changes in the structure and functioning of brain regions sensitive to stress, such as the hippocampus, the prefrontal cortex, and the amygdala (van Harmelen et al., 2014; Cross, Fani, Powers & Bradley, 2017). Trauma-induced brain changes are used to explain dysfunctional responses to stress, hypervigilance, attention and focus disorders, irritability, anxiety, and impulsivity in traumatized children and adolescents (Protić, 2016).

The Prevalence of Traumatization in Childhood and Adolescence

Data on the prevalence of abuse and neglect of children and adolescents significantly differ depending on abuse type, sex, country, and continent (Moody et al., 2018). Many cases of child abuse and neglect remain unrecognized and do not get reported or officially registered (Mathews, 2019). The Adverse Childhood Experiences (ACE) Study conducted in Serbia examined the prevalence of risk factors, adverse life experiences before the age of 18, and their consequences in terms of health and education outcomes on a nationally representative sample of adults aged between 18 and 65 years. The study revealed that 29.7% of participants experienced physical abuse at some point during their lifetime, while 13.6% experienced it frequently. Psychological abuse was experienced by 43.7% of participants, with 26.3% reporting frequent psychological abuse. A total of 2.8% of participants experienced sexual abuse at some point during their lifetime, while 18.5% reported experiencing psychological neglect (out of which 10.8% experienced it frequently) and 9.7% experienced physical neglect (with 5.6% experiencing it frequently). One in five participants had four or more frequent adverse childhood experiences (UNICEF, 2019).

Psychoactive Substances and Psychoactive Substance Use Disorders

Psychoactive substances are (chemical) substances that can be introduced into the human organism in different ways. Their presence in the body alters physiological and psychological functions and causes psychological and/or physical addiction. Psychoactive substances influence the central nervous system, have health-harming effects, and alter the consumer's behavior, mood, and consciousness (Ratković, 2017).

They include illegal drugs such as cannabis (marijuana or hashish), amphetamines, LSD and other hallucinogenic drugs, crack, cocaine, ecstasy, and heroin (World Health Organization, 2001). According to the relevant classifications of mental disorders, substance use disorders are defined as “harmful use” and the “addiction syndrome”. The abuse of these substances involves a behavioral pattern that negatively affects physical or mental health. It constitutes a maladaptive pattern of substance use that has harmful consequences for the individual’s health, professional and social functioning, and interpersonal relations (failure to fulfill duties at work, school, or home). It is characterized by the repeated use of substances in situations in which it can jeopardize the health and life of the individual (Backović et al., 2007). Addiction represents a set of psychological, behavioral, and cognitive phenomena, with the use of psychoactive substances becoming much more significant to the individual in comparison to behaviors once deemed important. The person has a strong urge to use the substance, develops tolerance, and loses control over its use. Addiction is associated with high levels of psychoactive substance use and the development of substance withdrawal syndrome once its use is discontinued (Đukić, 2015; Pejović Milovanović et al., 2021).

Psychoactive Substance Use Problems Among Adolescents

High-risk use of psychoactive substances among youth is a form of drug use accompanied by a high risk of harmful outcomes (injuries, delinquency, dropping out of school, fatal outcome) (CDC – Centers for Disease Control and Prevention, 2022) and it essentially corresponds to substance abuse. Addictive behavior is closely related to the process of adaptation to everyday challenges in the given culture and socioeconomic environment (Pikó, 2004). This link is particularly conspicuous in adolescence. Research has confirmed that experimentation with drugs is most common in adolescence (CDC, 2022). In most cases, the initiation of smoking and alcohol consumption occurs at the age of 13 or earlier, while experimentation with drugs begins somewhat later, at the age of 15-16 (CDC, 2022; Clemans-Cope et al., 2022). Out of all illegal drugs, young individuals most commonly abuse marijuana (Kljajević, 2017; Marić, 2011). Its use is a predictor of later abuse of other drugs (Dimitrijević, 2004). According to the CDC, 15% of secondary school students have tried illegal drugs, while 14% of students have abused prescription psychopharmaceuticals (CDC, 2022). A recent study examining drug use on a sample of 1,287 students of secondary schools in Belgrade revealed that 75% of participants had no contact with drugs. In the study, 4.4% of adolescents had only tried drugs but did not use them, 11.27% only used drugs, while 2.8% of students both used and distributed drugs (Radovanović et al., 2019).

Risk factors for psychoactive substance use in adolescence include a family history of substance use, parental approval of such practices and inadequate parental supervision, non-acceptance of one's sexual orientation or gender identity, association with antisocial peers, poor ties with the school system, low academic achievement, childhood abuse, a low socioeconomic status, and mental health problems (Pejović Milovančević et al., 2021; CDC, 2022). Greater exposure to risk factors yields a greater likelihood of drug use and can contribute to the development of an addiction. Different roads from psychoactive substance abuse to the development of an addiction essentially constitute the same process (Pikó, 2006).

The Correlation between Traumatic Experiences and Psychoactive Substance Use in Adolescence

Studies involving participants with addictive disorders in adolescence have consistently reported extremely high incidences of posttraumatic stress disorder and different childhood traumas, including physical, sexual, and emotional abuse (Basedow et al., 2020). Changes in the neurobiological functioning of young people who have experienced developmental trauma affect executive functions and emotion regulation and increase the risk of dissociation and mental disorders associated with trauma, such as posttraumatic stress disorder and depression (Cowell et al., 2015; Cross et al., 2017; McLaughlin et al., 2015). Due to all of the above, traumatized adolescents are more vulnerable to the effects of mood-altering drugs and more likely to develop an addiction (Mate, 2019). In traumatized young individuals, unpleasant emotional experiences (e.g., depression, insecurity, hopelessness, constant tension, and low self-worth) result in a predisposition to health-harming behaviors (e.g., smoking and consuming alcohol and drugs) as well as the early onset, accumulation, and perseverance of harmful behaviors, which are used to cope with both external and internal, psychological and other challenges that seem insurmountable (Mogyorósy-Révész, 2019). The use of drugs can be interpreted as an attempt to self-medicate, cope, and regulate unpleasant emotions (Bacsáné-Bula et al., 2019) as well as a way to mitigate the symptoms of depression and posttraumatic stress disorder related to the dysregulation of the biological response to stress (Basedow et al., 2020; Khoury et al., 2010).

The Importance of the School in the Prevention Programs and Practices Implemented in the Republic of Serbia

The school has a crucial role at all levels of the prevention of violence against children and adolescents as well as the promotion of mental health and healthy lifestyles among the youth.

Based on an insight into the comprehensive analysis of drug use prevention strategies at schools in the Republic of Serbia (National Operational Plan, 2020), it can be concluded that the implemented programs were relatively widespread, diverse, and mostly conducted over a longer period, although there were variations in terms of the level of organization and structure. The programs were mostly oriented towards children and youth but also parents and teachers. In most cases, they aimed to empower children and youth, improve students' personal and social skills, and increase their resilience to peer and social pressures, which is a concept that is in line with international standards (UNDOC & WHO, 2020). Some of the implemented programs supported the improvement of different parenting skills. Most of the programs were interactive, with the integration of the approaches of sharing knowledge and raising awareness, and they encouraged the active participation of students as well as teachers and parents in workshops, forums, and the like. The programs were conducted by educators in various fields, differing in competencies and expertise, as well as multidisciplinary teams. In our midst, there has been a noticeable increase in the engagement of peer educators, while the involvement of health experts has been rare although envisioned by international standards. Not much can be said about the effectiveness of the programs implemented in our midst due to the absence of an evaluation of their long-term effects (National Operational Plan, 2020). While drug use prevention programs have been relatively common in our midst, there has been a scarcity of programs focusing on the mental health of children and youth (National Operational Plan, 2020), especially ones devoted to traumatized children and children at an increased risk of violence and other forms of harm. At present, there are no specific recommendations in terms of psychosocial interventions aimed at minimizing negative mental health outcomes for adolescents exposed to violence or trauma, which is why universal interventions should be made available to this population (UNICEF Serbia, 2021).

METHOD

Research Aim. The main aim of the research was to examine the intensity of the correlation between traumatic experiences during childhood (i.e., formative years) and psychoactive substance use in adolescence.

Research Hypotheses.

H1: There is a positive correlation between the level of traumatization and psychoactive substance use.

H2: Adolescents who have had a traumatic experience are more likely to use psychoactive substances regularly.

H3: Students with traumatic experiences, despite having no history of drug use, plan or predict using psychoactive substances in the future.

Research Sample and Procedure. The research was conducted on a sample of students enrolled at seven secondary schools in Vojvodina during June 2022, with the previously obtained approval of the Ethics Committee of the Faculty of Medicine in Novi Sad and the consent of the schools' principals. The sample comprised 380 participants (36.3% male and 63.7% female). The participants were aged between 14 and 19 years, with a mean age of 16.52 years ($SD=0.116$). A total of 62.9% of adolescents lived in urban areas and 37.1% lived in rural settlements. Participation in the research was voluntary. Each participant signed an informed consent form. The time it took to fill out the questionnaire was between 15 and 20 minutes. The research was conducted in groups, during regular classes.

Instruments. In this research, the following questionnaires were employed: 1) The Questionnaire of Sociodemographic Characteristics and Psychoactive Substance Use, which was designed for the purpose of this research, and 2) the Childhood Trauma Questionnaire (CTQ; Bernstein, Fink, Handelsman & Foote, 1994).

The Questionnaire of Sociodemographic Characteristics and Psychoactive Substance Use contains closed-ended questions with structured response options. The items pertain to general sociodemographic characteristics (sex: male, female; age: number of years; place of residence: urban, rural; academic achievement in the previous academic year: sufficient, good, very good, excellent; the mother's and the father's level of education: primary, secondary, higher education; any experience using any of the listed psychoactive substances: yes, no; the frequency of psychoactive substance use: 0 –never, 1 –less than once a week, 2 –once a week, 3 –every day; the likelihood of future psychoactive substance use: 0–no, 1–probably not, 2 –maybe, 3 –probably yes, 4–yes). The questionnaire explains that psychoactive substances are drugs that affect the nervous system and alter the consumer's thoughts, feelings, and behaviors and that different types of psychoactive substances include marijuana,

amphetamines (e.g., speed), ecstasy, cocaine, LSD, hallucinogenic drugs (e.g., magic mushrooms), inhalants (e.g., glue, gasoline), sedatives, and heroin.

The Childhood Trauma Questionnaire (CTQ; Bernstein et al., 1994) is a retrospective self-evaluation scale designed to enable a quick, reliable, and valid evaluation of a wide range of traumatic experiences in children and adolescents. It is used for evaluating physical, sexual, and emotional abuse as well as physical and emotional neglect. The questionnaire contains a total of 28 questions and participants respond by circling a value on a five-point Likert-type scale ranging from 1 (*never true*) to 5 (*very often true*). For each subscale, there is an additional classification in the form of four categories (no trauma, low-to-moderate level of traumatization, moderate-to-severe level of traumatization, and severe-to-extreme level of traumatization) (Bernstein, Ahluvalia, Pogge & Handelsman, 1997; Bernstein et al., 1994). The overall reliability of the CTQ scale in this sample was $\alpha=.80$, while the reliability of the subscales ranged from $\alpha=.75$ to $\alpha=.88$, which constitutes a good-to-excellent internal consistency.

Statistical Methods. For the purpose of analyzing and describing the structure of the sample according to the relevant variables, frequencies and percentages were used to show the prevalence of a specific category or response in the sample. Descriptive statistics methods were employed to determine the measures of central tendency (the arithmetic mean), the measures of variability (the standard deviation), and the extreme values (the minimum and the maximum) of the observed numerical characteristics. Within comparative statistics, the following techniques were used: Spearman's correlation coefficient and the chi-squared test. In the applied tests, the limits for risk probability were set at the significance level of 95% ($p<0.05$) (significant difference between statistical parameters) and 99% ($p<0.01$) (highly significant difference between statistical parameters).

■ RESULTS

Table 1 shows the socio-demographic characteristics of the sample, while Table 2 contains data on the frequency of psychoactive substance use and the likelihood of future use. In answer to the question of whether they had ever used (any kind of) psychoactive substances, 295 (77.6%) adolescents gave a negative response, while 85 (22.4%) participants reported using at least one psychoactive substance.

Table 1. Sociodemographic characteristics of the sample

he Child's Academic Achievement	The Number of Participants	Percentage
Sufficient	10	2.6%
Good	38	10.0%
Very Good	128	33.7%
Excellent	204	53.7%
The Father's Level of Education		
Primary	29	7.6%
Secondary	233	61.3%
Higher	118	31.1%
The Mother's Level of Education		
Primary	23	6.0%
Secondary	188	49.5%
Higher	169	44.5%

Table 2: The frequency and likelihood of using psychoactive substances in the future

The Frequency of Using (Any Kind of) Psychoactive Substances	The Percentage of Participants
Never	84.8%
Less Than Once a Week	10.2%
Once a Week	3.2%
Every Day	1.8%
The Likelihood of Future Psychoactive Substance Use	
No	53.7%
Probably Not	12.1%
Maybe	12.1%
Probably Yes	4.7%
Definitely Yes	17.4%

When observing the four categories of total traumatization, based on the scores on the CTQ questionnaire, Table 3 shows that only 6.6% of participants reported experiencing no trauma, while most of them (62.9%) reported a low-to-moderate level of traumatization, and nearly one in three respondents (30.5%) had a moderate-to-severe or severe-to-extreme level of traumatization.

Table 3. Traumatization levels based on scores on the CTQ questionnaire

Traumatization Level	The Number of Participants	Percentage
No Trauma	25	6.6%
Low-to-Moderate Level	239	62.9%
Moderate-to-Severe Level	83	21.8%
Severe-to-Extreme Level	33	8.7%

Hypothesis 1. There is a positive correlation between the level of traumatization and psychoactive substance use. To determine the link between the level of traumatization (according to the applied CTQ questionnaire) and the frequency of psychoactive substance use, Spearman’s correlation coefficient was employed.

Table 4. The coefficients of the correlations between traumatization level and psychoactive substance use and the level of significance

Traumatization	Psychoactive Substance Use
Traumatization Categories in the CTQ Questionnaire ^a	.28**
The CTQ Questionnaire ^b	.34**
Emotional Abuse	.38**
Physical Abuse	.25**
Sexual Abuse	.35**
Emotional Neglect	.10*
Physical Neglect	.14**

Note. ^athe number of domains in which abuse was registered, i.e., the number of abuse types, ^bthe total score on the CTQ scale, ***p <.001, ** p <.01, *p <.05

As seen in Table 4, in the case of the link between the level of traumatization and psychoactive substance use, all correlations were significant and positive, although weak. Such correlations indicate that the higher the level of total traumatization (the total score on the CTQ scale) or domain traumatization, the more likely the adolescents were to use psychoactive substances. This finding confirmed the first hypothesis.

Hypothesis 2. Adolescents who have had a traumatic experience are more likely to use psychoactive substances regularly. To determine whether participants who more frequently used psychoactive substances also had traumatic experiences, the chi-squared test was used. Table 5 shows participant frequency per category in relation to the frequency of psychoactive substance use and the level of traumatization. The obtained results revealed statistically significant differences in the frequency of psychoactive substance use among participants who differed in the level of traumatization ($\chi^2=48.49$, $df=9$, $p>.00$). This finding confirmed the second hypothesis.

Table 5. The level of traumatization and the frequency of psychoactive substance use

Traumatization	The Frequency of Psychoactive Substance Use				Total
	No	< 1 a Week	1 a Week	Every Day	
None	21	4	0	0	25
Low to Moderate	220	12	4	3	239
Moderate to Severe	64	14	4	1	83
Severe to Extreme	17	9	4	3	33
Total	322	39	12	7	380

Hypothesis 3. Students with traumatic experiences, despite having no history of drug use, plan or predict using psychoactive substances in the future. To determine whether there was a link between the intensity of the traumatic experience and the participants' belief that they would use psychoactive substances in the future, Spearman's correlation coefficient was used.

Table 6. The coefficients of the correlations between traumatization intensity and the idea of future psychoactive substance use and the level of significance

Traumatization	Future Psychoactive Substance Use
Traumatization Categories in the CTQ Questionnaire ^a	.28**
The CTQ Scale ^b	.32**
Emotional Abuse	.39**
Physical Abuse	.19**
Sexual Abuse	.29**
Emotional Neglect	.12*
Physical Neglect	.16**

Note. ^a the number of domains in which abuse was registered, i.e., the number of abuse types, ^b the total score on the CTQ scale, ***p <.001, **p <.01, *p<.05

As shown in Table 6, in terms of the relationships between the intensity of the traumatic experience and the idea of future psychoactive substance use, all correlations were significant and positive. This indicates that the higher the total or domain traumatization level, the more likely it was for adolescents to believe that they would use psychoactive substances in the future. This finding confirmed the third hypothesis.

■ DISCUSSION

According to the results of the present study, which was conducted on a random sample of 380 adolescents (aged between 14 and 19 years) attending secondary schools in Vojvodina, more than one in five secondary school students (22.4%) reported using at least one of the listed psychoactive substances at some point during their lives. One in 10 (10.2%) participants claimed that they used psychoactive substances less than once a week, 3.2% reported using one a week, while 1.8% stated that they used psychoactive substances every day. These findings are in line with the results of a recent study conducted on a sample of 1,287 secondary school students in our midst (Radovanović, Spasić & Radovanović, 2019). In our sample, a total of 130 (34.2%) participants stated that there was a chance that they would try a psychoactive substance in the future.

The obtained results regarding the exposure of adolescents to some form of traumatization can be considered alarming. A total of 355 (93.4%) participants reported experiencing some form of abuse. As many as 239 (62.9%) adolescents had a low-to-moderate level of traumatization, 83 participants (21.8%) had a moderate-to-severe traumatization level, while 33 participants (8.7%) had a severe-to-extreme level of traumatization. In our sample, the most common form of abuse was emotional abuse, which is in line with the results of the ACE study conducted in Serbia on a nationally representative sample (UNICEF, 2019).

According to the results of the present study, psychoactive substance use shared significant positive correlations with the intensity of experiences of emotional, physical, and sexual abuse and emotional and physical neglect. This is in line with findings suggesting that children who have experienced abuse are at risk of developing substance abuse problems in adolescence and later in life (Ujhelyiné-Nagy & Kuritárné-Szabó, 2020; Cicchetti & Handley, 2019). The ACE study also revealed links between substance abuse and alcohol consumption in adulthood and all types of adverse life events before the age of 18 as well as the total number of adverse life events ever or frequently experienced (UNICEF, 2019).

In our sample, emotional abuse ($r=.38$), sexual abuse ($r=.35$), and the total level of traumatization ($r=.34$) most strongly correlated with psychoactive substance use. This finding is in line with studies suggesting that emotional abuse can be the most dangerous form of abuse due to its harmful effects on the child's brain development, affecting emotion regulation and self-awareness (Dye, 2020; Heim et al., 2013). Long-term consequences include depression, anxiety, low self-respect, and extreme emotions or emotional blunting (Dye, 2020), which can lead to psychoactive substance abuse among children and the youth who have experienced emotional abuse, as an attempt to regulate unpleasant emotions (Heim et al., 2013).

The link between sexual abuse in childhood and substance use later in life has been well-documented in various studies (Hailes et al., 2019; Maniglio, 2011). Adolescents who have experienced sexual abuse have low self-respect and more symptoms of depression (Kim, Park & Park, 2017) and they more commonly exhibit symptoms of posttraumatic stress disorder (Jin et al., 2022), which can contribute to more frequent psychoactive substance use with the aim of mitigating the above mentioned symptoms and regulating unpleasant emotions. Health-harming behaviors, such as psychoactive substance abuse, can be described as a pathological mode of emotion regulation to which adolescents resort in the absence of adequate strategies for controlling and modulating emotions (Ilijić, 2008; Momene et al., 2021; Ujhelyiné-Nagy & Kuritárné-Szabó, 2020).

This study confirmed that adolescents who have had more intense traumatic experiences (i.e., those with moderate and severe traumatization levels) tend to use psychoactive substances more frequently. In addition to the correlation between the intensity of the traumatic experience and substance use, the results revealed a correlation between the intensity of the traumatic experience and the idea of future substance use. Namely, adolescents with higher traumatization levels, despite having no history of drug use, more often intended to use or believed they would use a psychoactive substance in the future.

The provision of timely and adequate support can help traumatized children and adolescents prevent or mitigate negative consequences for their physical and mental health and academic achievement (UNICEF, 2019; UNICEF in Serbia, 2021). Traumatized children and adolescents are at a higher risk of psychoactive substance abuse (Cicchetti & Handley, 2019), which is why it is particularly important to ensure the timely implementation of prevention programs adapted to their specific needs (Momene et al., 2021; Hsiung et al., 2022).

The results of this study revealed that an alarmingly large number of adolescents reported experiencing trauma, which points to potential risks for their mental health and psychosocial functioning, including psychoactive substance abuse. On the other hand, in our midst, there is a lack of prevention programs intended for children and the youth who have experienced trauma and/or are at risk of being exposed to violence and other harmful events.

Teachers and school psychologists and pedagogists, who are in daily contact with children and the youth, could be the first to recognize traumatization in students and the first in whom students could confide, which is why the school should have a significant role in recognizing traumatization and providing adequate support (Benningfield, Riggs & Hoover, 2015).

Recommendations for the development of a trauma-informed educational approach at schools (Borjanić Bolić & Ristić, 2021) include strategies focusing on:

- additionally educating teachers to recognize signs of trauma or stress in students and identify students who are at a higher risk of traumatic and negative life events;
- improving the understanding of the specific problems traumatized students face in the school context that can lead to poorer academic achievement, such as concentration problems and difficulties in behavioral self-regulation and the establishment of relations with peers and adults (Borjanić Bolić & Ristić, 2021);
- adapting teaching practices and approaches to the current needs of traumatized students to reduce negative education outcomes;
- establishing inter-sector collaborations with experts in mental health, social protection, and other fields with the goal of forming a comprehensive network of support for students;

- helping traumatized students develop emotion understanding and regulation skills, stress-coping strategies, self-respect, and positive relations with others in order to improve their regulatory abilities, renew their attachment patterns, and increase their psychological resources (Borjanić Bolić & Ristić, 2021; Brunzell, Stokes & Waters, 2016);
- improving the school atmosphere and strengthening students' ties with the school and peers in order for traumatized students to feel safe and secure in the school environment;
- developing a school setting in which violence and discrimination are not tolerated and socially acceptable behavioral patterns are valued.

It is necessary to implement *primary prevention* plans at schools and enrich schools' existing prevention programs by incorporating components focusing on traumatization, mental health, and healthy lifestyles. One of the key steps would be educating both students and parents about substance abuse and its negative consequences (UNICEF, 2019) as well as the different forms, signs, and consequences of traumatization, with an emphasis on mental health and the improvement of students' stress-coping strategies as well as strategies focusing on developing and honing parental skills.

It is crucial to develop and implement prevention programs aimed at psychologically supporting and empowering all students. Such programs would include group psychological workshops, individual counseling provided by school counselors as needed, and the timely referral of children and the youth to mental health experts. It is paramount to involve parents via occasional group lectures or workshops aimed at improving parental skills, recognizing the signs of traumatization and risky behavior in children, and familiarizing parents with ways to seek and receive help for the child and the family. Such programs could be implemented by specially trained school counselors employed at schools or individuals outside the school system who possess the qualifications necessary to implement these programs (e.g., psychologists, social workers, psychiatrists, and in some domains, peer educators).

■ CONCLUSION

Abuse and neglect within or outside the family during childhood and adolescence have consequences for the entire development of an individual. One of the prominent consequences is the use of psychoactive substances. While it is possible to differentiate between multiple forms of abuse, from the perspective of this paper, the three crucial forms are sexual, physical, and emotional abuse or neglect. The results of the present research revealed a significant positive correlation between the

intensity of the trauma and the frequency of psychoactive substance use. In other words, trauma constitutes a risk factor for future use of psychoactive substances. Adolescents with posttraumatic symptoms and emotional impairments, who have not emotionally overcome the trauma, tend to use psychoactive substances as a maladaptive form of coping with painful emotions and mental health problems (Momene et al., 2021). According to the results of the present research, the early recognition of signs of trauma in students is crucial for providing timely and adequate support and treatment aimed at preventing or mitigating mental health consequences, including psychoactive substance abuse. The school system has a significant role in this process (Ilijić, 2008; Hsiung et al., 2022) as it constitutes the social context in which young people spend a large portion or even most of their time. Schools in our midst have implemented different psychoactive substance abuse prevention programs, but insufficient attention has been paid to programs focusing on traumatization, youth's mental health, and providing psychological support to students (National Operational Plan, 2020).

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