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Original research article

Prevalence of substance use among adolescents in residential educational facilities in the Czech Republic

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Abstract
This study presents part of the research from a 2019 project in Czechia's residential educational facilities for children with emotional and behavioral disorders. The high prevalence of drug use among these adolescents has a cumulative set of harms to health.

The main research objective was to examine the prevalence of substance use among adolescent girls and boys living in residential educational facilities. The auxiliary research objective was to compare its results with the ESPAD (2015 and 2019) survey of the general Czech adolescent mainstream population.

The sample consisted of 204 respondents aged 15–19 years. The primary data collection instrument was the ESPAD questionnaire. The analysis of the collected data was carried out using SPSS software. The findings arrived from statistical procedures such as descriptive data analysis and various statistical methods. Data from ESPAD research (2015, 2019) was selected for analytical comparisons.

The findings indicate a high prevalence of drug use among the study group of adolescents in residential education facilities and a high majority of selected substance use in comparison with the results found in the ESPAD (2015, 2019) study in the general school population of Czechia.

The findings support a systemic focus on the prevention of health risks, harm reduction, as well as the treatment of substance use disorder among adolescents. Data on the incidence and prevalence of substance use should be regularly collected and evaluated in these facilities

Keywords: Adolescents; Emotional and behavioral disorders; ESPAD study; Facilities; Prevalence; Residential; Substance use

Introduction

This text presents the results of research that focused on substance use by girls and boys living in residential facilities. These adolescents have been placed in residential educational facilities because they were diagnosed with severe behavioral and emotional disorders. For this reason, these adolescents should be seen as highly vulnerable individuals at risk of mental health problems, substance abuse, criminal activity, self-harm, and suicidal behavior. The purpose of the research is to discover how the characteristics of adolescents with emotional and behavioral disorders (EBD) condition reinforce risk and substance use rates. Risky behavior and adverse experiences are complications of adolescence in residential facilities in the Czech Republic. One common type of risk behavior is substance use, which often involves experimentation with a substance, which leads to substance use disorder (SUD). A negative impact of risky behaviors on the child's personality may also affect the child's upbringing and his/her education, often involving behavior related to violating legal norms (Dolejš and Orel, 2017; Nielsen Sobotková et al., 2014).

The purpose of the research is to identify the characteristics of adolescents with emotional and behavioral disorders (EBD) condition that reinforce risk and substance use rates. The main research objective was to examine the prevalence of substance use among adolescent girls and boys living in residential educational facilities. The auxiliary research goal is to compare them with the general Czech adolescent mainstream population.

The systematic collection of data on drug use among vulnerable adolescents in residential education facilities is not carried out by the founder of these institutions (the Ministry of Education of the Czech Republic). In the last few years, isolated partial research or pilot research studies in the field of mental health have appeared (Doležalová, 2019; Doležalová et al., 2022a).

Our research was focused on boys and girls aged 15–18 who have been court-ordered to stay in residential educational facilities for a long time. A frequent reason for placement in residential education is truancy, risky behavior, violation of school norms, and severe emotional and behavioral disorders. Adverse experiences and developmental trauma in early childhood, emotional attachment disorders, non-existent family

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or foster care, and risky social and educational environments (drug-using parents, domestic violence, neglect, abuse, etc.) have a substantial impact on health (Estéves et al., 2017). Commonly, these adolescents are referred to as adolescents with emotional and behavioral disorders (EBD) and adverse childhood experiences (Doležalová et al., 2022a, b; Velemínský et al., 2017; Vish et al., 2020). A common characteristic of their life experiences is an addiction to tobacco and other drugs from early adolescence (Mrug et al., 2010). In addition, these adolescents have extensive psychiatric comorbidities (depression, anxiety, suicidal behavior, self-harm, panic attacks, ADHD, eating disorders, sleep disorders, impulsivity, mood disorders, etc.) These children have varying degrees of severity of so-called emotional and behavioral disorders, but they may also have false diagnoses (misdiagnosis) (Jones et al., 2019). This group includes adolescents who tend to be emotionally neglected, have communication disorders, or have underdeveloped social skills due to an unstimulating family environment.

Adolescents with emotional and behavioral disorders also tend to manifest risky sexual behavior. They seek out dangerous situations and establish social norms that harm the individual and his/her social environment (Dolejš, 2010). It is not uncommon for adolescents in residential facilities to self-harm or have suicidal ideations. As suggested, such behavior often stems from childhood traumas, mental health problems, long-term treatment with psychopharmaceuticals, and unsupportive social environments (Doležalová, 2018).

According to several studies, these are highly vulnerable adolescents with specific educational, psychosocial, health, and educational needs and, therefore, require more support in developing their personalities (Chilakamarri et al., 2011; Merten et al., 2017).

Adolescents are placed in residential facilities due to long-term adverse experiences and risky behavior. A broader analysis concludes that girls who have a history of childhood trauma and family trauma, were emotionally abused as children, or never received enough love from their parents, have low self-esteem and lack a sense of purpose (Doležalová, 2019).

Janský (2014) mentions several characteristics of younger children under 15 years of age living in a residential or protective education facility and their families. These children very often continue their stay in institutional education in adolescent facilities. Janský (2014) states that most children come from divorced and criminal families; they show very poor academic proficiency, lack interest in positive leisure activities, have a high interest in experimenting with substances, and show high levels of aggression. Delinquent behavior is typical – most often in the form of truancy and theft, as well as running away from home, disrespect for authority, and risky sexual behavior – associated with early initiation of sexual activities, prostitution, and a high interest in gangs and gang life.

Children who are placed in residential educational facilities are also very often psychiatric patients from early childhood. They often suffer from emotional disturbances, impulsive reactions, lack of self-confidence. Most children in these institutions cannot understand the consequences of their actions.

The main objective of residential education is to provide "alternative educational care in the interests of the child's healthy development, proper upbringing and education" (Act No. 109/2002 Coll., § 1, para. 2). Some of these institutions also provide schooling and the possibility of secondary education. These are generally state-run establishments that offer their services based on court decisions. Sometimes, the persons responsible for the child's upbringing may also request the service. School establishments for the performance of protective education include diagnostic institutes, children's homes, children's homes with schools, and juvenile correctional facilities.

The Ministry of Education of the Czech Republic, as the provider of these facilities, has not historically collected any data on substance use among adolescents in residential educational facilities. There is no current information on the prevalence of drug use among these adolescents. There are no addictologists working in these facilities, nor are there any systemic prevention or treatment interventions in the setting. These adolescents are not included in national the European School Survey Project on Alcohol and Other Drugs (ESPAD) prevalence studies. For this reason, we conducted our first study mapping the prevalence of substance use among these vulnerable adolescents compared to a group of adolescents in mainstream education.

The main research objective was to examine the prevalence of substance use among adolescent girls and boys living in residential educational facilities. The auxiliary research objective is to compare them with results found in the ESPAD (2015 and 2019) survey of the general Czech adolescent mainstream population.

Materials and methods

To compare the results, we relied on two ESPAD 2015 and 2019 studies (Chomynova et al., 2016, 2020).

Sample, ethics, and data collection

The research sample consisted of 204 respondents (girls and boys) aged 15–19 years who were in one of 15 residential education facilities. In the Czech Republic, this network consists of 25 educational facilities and 13 diagnostic institutions. More girls are represented in the research population (N = 121), as facilities where girls are placed were more willing to cooperate with the research than facilities where boys are placed (N = 83). Also, some of the facilities where boys stay were less accessible.

The research and data collection took place in 2019. The research field was residential educational facilities. The research group was formed and selected in two steps. First, residential facilities and diagnostic centres were selected and approached. Vulnerable adolescents can also be identified in the mainstream education system. However, there are vulnerable adolescents with significant EBD in institutional settings. These adolescents are formally placed in residential facilities, following a court order.

Our sample of these facilities was based on several ethical factors. Considering the sensitive nature of the topic, which

Table 1. Basic characteristics of the sample

Structure of respondents by gender and age		
Variable	*N*	%
Gender		
Boys	83	40.7
Girls	121	59.3
Year of birth		
2001 and earlier	51	25.0
2002	70	34.3
2003	70	34.3
2004 and later	13	6.4
Total	204	100.0

is closely linked to the issue of trust and safety, we tried to ensure the safest possible atmosphere for data collection from the point of view of the respondents' situation. Therefore, we surveyed 15 residential facilities. In addition to the type of facility, the primary selection criterion was that these were facilities with which the team members had already established cooperation. This aspect was also important because the facilities for the performance of institutional education have limited access and can be considered quasi-total institutions. The opportunity to enter the facility and collect data in the facility itself was essential for the data collection, as was the trust of the facility staff in the research team members. This is because it can be assumed that it was possible to maximize the sense of security of the respondent-clients themselves.

One of the selective factors that co-determined the nomination of a respondent to the research population was the possibility of voluntary participation or non-participation in our research. Participation in the study was voluntary, and it was possible to refuse to participate (including while the investigation was already underway), not to answer any of the questions, or express disagreement with the processing of specific data or information without giving any reason. This possibility was clearly stated and highlighted in the informed consent form signed by the respondents.

The participating respondents received and signed information about the research project and were informed about their role in the project and their rights related to this role. They were also provided with information about anonymous data processing. This was done through informed consent, which the Masaryk University legal department approved.

Before each data entry, approval was also obtained from the management of the respective school facility. Furthermore, the date of implementation and the conditions of the data collection were selected by agreement. We quantitatively surveyed boys and girls living in residential facilities in 2019.

The actual data collection took the form of a questionnaire survey. The main survey instrument was a modified ESPAD questionnaire from 2015. It was used to determine the prevalence of selected substance use among girls and boys in institutional care. This study presents the prevalence of selected substance use among adolescents in residential educational facilities in the Czech Republic. We also compared the general school population of adolescents according to the ESPAD 2015 and ESPAD 2019 studies. The findings reveal a high prevalence of substance use among vulnerable adolescents with emotional and behavioral disorders in residential educational facilities.

It makes sense to define the characteristics of the research population in the context of the target population's characteristics. In the 2018/19 school year, 933 adolescents in the Czech Republic stayed in residential educational facilities (348 girls, 585 boys), and 204 adolescents over 15 remained in diagnostic school institutions. Meanwhile, our research sample comprised 204 respondents, approximately 1/5 of the target population of young people in that period. A sample of nearly 3,000 girls and boys aged 15–16 from the ESPAD study (2015 or 2019) conducted by the National Monitoring Centre for Drugs and Drug Addiction in 2015 and 2019 in Czech schools was used as the reference group, see Table 2.

Table 2. Number of respondents surveyed in the study group and reference groups from the ESPAD study (2015, 2019)

	ESPAD 2015 *N*	Study group *N*	ESPAD 2019 *N*
Total	2738	204	2778

Research tool and data processing

The European School Survey Project on Alcohol and Other Drugs – ESPAD 2015 (Chomynová et al., 2016) questionnaire was used to collect data on the prevalence of substance use, and it was adapted and shortened for our research. The ESPAD study (2015) is a long-standing screening source of information on substance use among European students. The questionnaire examines the prevalence of drug use in the past month or year. The instrument also aims to distinguish gender differences. The international ESPAD study focuses on smoking, drinking, using illegal substances, gambling, and computer gambling among students aged 15–16. The study is repeated every four years under the coordination of the European Monitoring Centre on Drugs and Drug Addiction (EMCDDA, 2016). The National Monitoring Centre carries out the data collection and implementation of the Study for Drugs and Addiction (NMCDA), an office of the Government of the Czech Republic (Chomynová et al., 2016).

Statistical analysis

The analysis of the collected data was carried out using SPSS software for statistical analysis of quantitative data. The findings were reached with the help of statistical procedures such as descriptive data analysis, *T*-test, and various statistical verification methods. For analytical comparisons, selected ESPAD (2015) research data was used. Data on ESPAD (2019) were unavailable to us. Therefore, we used only publicly available ESPAD (2019) findings to compare.

Selected results of the study

The research found that the prevalence of drug use among girls and boys living in residential educational facilities is several times higher than in the general Czech adolescent population.

Data on the prevalence of use in the last month were as follows:

- Alarming prevalence of smoking among adolescents in institutional education (boys 91%, girls 91%) compared to adolescents in mainstream school (ESPAD 2015: boys 30%, girls 33%; ESPAD 2019: boys 21%, girls 27%).
- The prevalence of cannabis use among the adolescents studied is much higher among boys than girls (boys 63%, girls 46%) compared to adolescents in mainstream schools (ESPAD 2015: boys 17%, girls 12%; ESPAD 2019: boys 12%, girls 12%).
- The studied group of adolescents use alcohol extensively (boys 67%, girls 55%), but with a lower prevalence compared to adolescents in mainstream schools (ESPAD 2015: boys 72%, girls 69%, ESPAD 2019: boys 41%, girls 36%).
- Methamphetamine use among the adolescents surveyed is alarming (21% boys, 26% girls) compared to regular school adolescents (ESPAD 2015: 1.5% boys, 0.5% girls; ESPAD 2019: boys 0.3%, girls 0.5%).

As the statistical results show (study data, ESPAD 2015 data), the odds ratio in the prevalence of Nicotine, Cannabis, and Methamphetamine use among adolescents in institutional care is significantly high (p-value < 0.001). Alcohol is probably a less preferred drug for adolescents in institutional care because it is relatively easy to obtain and generally not as appealing. However, there is a noticeable difference in the high prevalence of alcohol use in the school population of girls and boys under 18 years of age as opposed to adolescents in institutional care, see Tables 3a and 3b. The prevalence of use of all the drugs of interest among girls and boys in residential unique education settings is statistically significant (*T*-test) compared to the general school population.

Tables 3a and 3b show results of statistical procedures – comparison study data and data from ESPAD 2015. Relevant publicly available findings of ESPAD 2019 are presented in the orange fields.

Table 3a. Boys – Prevalence of substance use – last month

Substance	Boys – ESPAD 2015 %	Boys – Study group %	Odds ratio	*P* > z	Boys – ESPAD 2019 %
Nicotine	30.2	91.1	23.8	<0.001	20.8
Alcohol	72.1	68.6	0.8	0.515	40.8
Cannabis	16.8	63.1	8.5	<0.001	11.6
Methamphetamine	1.5	21.1	17.7	<0.001	0.3

Table 3b. Girls – Prevalence of substance use – last month

Substance	Girls – ESPAD 2015 %	Girls – Study group %	Odds ratio	*P* > z	Girls – ESPAD 2019 %
Nicotine	33.0	90.8	19.9	<0.001	26.5
Alcohol	68.7	55.1	0.6	0.003	36.1
Cannabis	12.0	46.1	6.3	<0.001	11.6
Methamphetamine	0.5	25.9	70.9	<0.001	0.5

Strengths and limitations

A significant positive of this research was the opportunity to obtain a large amount of data for adolescents with emotional and behavioral disorders at residential educational facilities. Until now, the Ministry of Education has never systematically collected such data. The helpful attitude of these facilities' directors, the voluntary involvement of the adolescents, and good cooperation without incentives were other strengths.

We ought to note that our research sample represents a specific group that drops out of the ESPAD national surveys because they are people placed in educational institutions by court order. This makes these adolescents a challenging research population to reach in terms of research. The results of our research are thus an opportunity to investigate the experience of the members of this group.

Research limitations can be found within the following areas: data processing, time demands, missing data from unanswered questions, and differences in the essential characteristics of the research sample compared with samples of ESPAD 2015 and 2019.

We handled extensive administration, project preparation, and informed consent procedures, including additional ethical requirements. We anticipated some imprecision in completing the questionnaires, including missing data that may be marked by terminological ambiguity and the length of the questionnaire or the sensitivity of some questions. There was also the time involved in the statistical processing, extensive data analysis, and evaluation of the findings.

The size of the research sample is sufficient for our purposes. Although not all questions were fully answered in some questionnaires, this did not significantly impact the study's overall results. Due to ethical requirements, the research was anonymous, putting a limit to the long-term follow-up of the development of these vulnerable adolescents. Due to the uniqueness of this study, it is only possible to partially compare its results with other comparable research.

The age and gender distribution of our research sample (see Table 1) are not entirely consistent with the age distribution of the ESPAD research populations (2015, 2019). This may be a source of some bias in the results since there is no research on the general population that matches our research population's distribution (or the group of people in educational institutions). Given the necessity of a baseline comparison of groups in research, these possible biases must be considered.

During the collection and analysis of the data file, we had the ESPAD 2015 dataset available, and it was, therefore, possible to use it for more sophisticated statistical procedures. However, we did not have a data file of ESPAD 2019 and were therefore reliant on results from publicly available sources. We perceived that using the ESPAD 2019 data would be relevant to compare the data from our 2019 research. However, we had to work with the data available to us and focus on our work's aims. It was essential for us to investigate the risks and prevalence of drug use in the adolescent population in residential educational facilities and compare them with the results of the general population. The above data sources from our research are sufficient for the comparison.

For the aims of this study, we were primarily concerned with demonstrating the high prevalence of drug use among adolescents in residential settings – this vulnerable group of adolescents drops out of ESPAD prevalence studies and needs attention. Financial constraints delayed the data processing and production of this paper.

A comparison of publicly available results relevant to us from ESPAD 2015 and ESPAD 2019 (see Table 3a and Table 3b) does not show significant differences in last month's use of the drugs of interest compared to the results of our research population. Although there is a significant shift in alcohol use between ESPAD 2015 and ESPAD 2019 (boys 72% vs 41%, girls 69% vs 36%), even these results suggest that our respondents are at a high-risk of alcohol use (boys 69%, girls 55%).

Discussion

This first research is unique because there is a lack of data on adolescents in residential care in the Czech Republic. The research aimed to determine the prevalence of substance use among adolescent girls and boys living in residential educational facilities and to compare them with the general Czech adolescent mainstream population.

Many findings have emerged from our research, which aims to identify adolescents' health risks, educational prospects, and mental health in residential facilities settings. Indeed, there are marked differences in the substance use experiences of the adolescent study group compared to a reference group of the so-called general population.

The findings indicate a high prevalence of drug use among the study group of adolescents in residential education facilities and a high majority of selected substance use in comparison with the results found in the ESPAD (2015, 2019) study in the general school population of the Czech Republic. The prevalence of smoking among adolescents in institutional education (boys 91%, girls 91%) was compared to adolescents in mainstream schools (ESPAD 2015: boys 30%, girls 33%; ESPAD 2019: boys 21%, girls 27%). The prevalence of cannabis use among the studied adolescents is much higher among boys than girls (boys 63%, girls 46%) compared to adolescents in mainstream schools (ESPAD 2015: boys 17%, girls 12%; ESPAD 2019: boys 12%, girls 12%). The studied group of adolescents use alcohol extensively (boys 67%, girls 55%), but with a lower prevalence compared to adolescents in mainstream schools (ESPAD 2015: boys 72%, girls 69%, ESPAD 2019: boys 41%, girls 36%). Methamphetamine use among the surveyed adolescents is alarming (21% boys, 26% girls) compared to regular school adolescents (ESPAD 2015: 1.5% boys, 0.5% girls; ESPAD 2019: boys 0.3%, girls 0.5%).

Several studies of vulnerable adolescents also show multiple mental health and substance use problems (Garofoli, 2020; Tims et al., 2002). Almost all boys and girls in the study group (over 90%) have used tobacco in the last month, which is many times more than 30% in the reference group (EMCDDA, 2016). In the case of alcohol, the results of our analysis are quite the opposite. Alcohol consumption in the general school population was reported by over half of the girls and almost 67% of the boys in the last month, compared to 72% in the treatment group of adolescents in residential educational facilities. This information can be explained by the generally lower interest in alcohol among adolescents in residential education, as it is relatively available. However, the prevalence of alcohol use is a significant risk for both groups (Gutierrez and Sher, 2015). Alcohol is more likely to be available in the family environment and tolerated (Olecká et al., 2023; Wlodarczyk et al., 2017). However, demanding behavior in these at-risk adolescents also leads to worsening of mental problems or suicidal behavior (Gobbi et al., 2019).

Both boys and girls placed in these residential facilities are more likely to prefer drugs to numb their emotional pain and anxiety, to relax, and to escape from other problems related to the family environment (Estéves et al., 2017). These drugs may also be more attractive because of their lower availability and underestimated risks in misrepresenting their effects.

Our research, which we present in this text, points to a long-term adverse situation of increasing drug use among girls and a significantly higher prevalence among boys. Our findings and the trend are alarming, with almost 90% of adolescents regularly smoking and using other drugs long-term. Frequent interactions between genetic and environmental influences and comorbid mental health disorders are more common than solely substance use disorders in adolescents (Fahimi et al., 2015). The long-term unaddressed prevention and treatment situation is a health "time bomb", with approximately 1,000 vulnerable adolescents with behavioral and mental health risks in the institutional system. Given the long-overlooked health, social, and educational risks, this represents a significant systemic underestimation and failure to find systemic action to improve the situation.

Adolescents living in residential educational facilities, especially boys, start smoking in childhood. Experience suggests that about half of boys have moderate to severe tobacco dependence, according to the Fagerstrom Test of Nicotine Dependence (Králíková et al., 2005). From the point of view of prevention and treatment, these are alarming trends that require systemic preventive, therapeutic, and legislative solutions on the part of the Ministry of Education, which establishes a network of institutional education facilities within special education for children and youth with behavioral and emotional disorders and special educational needs.

Conclusion

Our research aimed to determine the prevalence of substance use among adolescent girls and boys living in residential educational facilities and to compare it with adolescents in mainstream schools. The findings indicate an increased propensity to drug use among the study group of adolescents in residential special education and a high prevalence of selected substance use. According to the results, girls appear more prone to use certain drugs and more sensitive to adverse mental and physical health. However, boys also showed a high prevalence of substance use in the last month. The high prevalence of smoking among boys and girls living in institutions is alarming.

The current practice of residential educational facilities is based on the traditional legislation-based education system. Tolerance of adolescent smoking in residential school settings is common even though the law does not allow it. Some of these adolescents also have a diagnosis of substance used disorder. The findings support systemic changes and the collection of epidemiological data. Changes would require adding experts within the multidisciplinary teams in institutional education and further staff training. Legislative changes would require directing interventions toward indicated prevention, treatment, and harm reduction elements throughout education in multidisciplinary settings.

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Ethical aspects and conflict of interest
The authors have no conflict of interest to declare.

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