# DRUG USE IN ADOLESCENTS WITH MILD INTELLECTUAL DISABILITY IN DIFFERENT LIVING ARRANGEMENTS

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Aims: This study explored the prevalence and patterns of cigarette, alcohol and illicit drug use among adolescents with mild intellectual disability (ID) residing in different types of living arrangements in Serbia.

Methods: A total of 100 male and female adolescents, aged 13-20 years, attending special schools for students with ID completed a self-report measure on drug use. Fifty adolescents lived with their parents, and the other fifty lived at residential schools.

Findings: Overall, the prevalence rates of having ever used cigarettes, alcohol and marijuana were 63%, 49% and 4%, respectively. Boys were more likely to use drugs than girls. The higher prevalence and more severe patterns of drug use were found in adolescents living in residential settings. The significant differences were mainly related to smoking.

Conclusions: The findings from the present study suggest that a substantial number of adolescents with ID had experienced drug use. Implications for future research and prevention practice were discussed.

Keywords: adolescents, alcohol, cigarettes, illicit drugs, smoking, intellectual disabilities, boarding schools, special educational needs, Serbia

## INTRODUCTION

A considerable amount of research has focused on drug use during adolescence; however, few studies have paid systematic attention to adolescents with intellectual disabilities (ID). Preliminary evidence regarding drug use in this population is mixed, and it is difficult to provide a clear answer about the similarity between adolescents with and without ID in that regard. The reasons for the confusing results include the differences in the operationalisation of ID and drug use, such as methodological variations in the sampling, instrumentation, time-span surveyed.

In the present article we used the ICD-10 definition of IO. The ICD-10 defines IO as "a condition of arrested or incomplete development of the mind, which is especially characterized by impairment of skills manifested during the developmental period, which contribute to the overall level of intelligence, i.e. cognitive, language, motor, and social abilities" (World Health Organization, 1992, p. 226). Hence, we only included the results of those studies in which the authors, when describing the participants, used the following terms: a) intellectual disability or mental retardation, b) learning difficulties (with a note that it is the UK term for ID), c) learning disability, provided that on the basis of the quotations and self-quotations used it is unambiguously clear that the above mentioned term was used as a synonym for ID, and d) developmentally handicapped children, as from the description of that phrase in one paper it was clear that it was ID. The next section reviews findings from previous studies on the prevalence of cigarette, alcohol and illicit drug use in adolescents with ID.

The prevalence rates of smoking in adolescents with ID were rather inconsistent. Among the students with ID receiving special education school services in the US, Gress & Boss (1996) found the prevalence of current smoking to be 4.9-26.9% depending on the school grade (not containing data on the age of students). British studies reported the following findings: 15% of adolescents with ID had smoked more than once and 14% smoked currently (Emerson & Turnbull, 2005); 30% of children and adolescents with ID living in state care had smoked (Taggart, Cousins, & Milner, 2007); 30.1% of adolescents with ID and behavioural/emotional problems and none of the students with ID and without behavioural/emotional problems had ever smoked (Taggart, Taylor, & MacCrum-Gardner, 2010); 16% of boys and 17% of girls with ID reported at age 13-14 years that they had ever smoked, and 27% of boys and 21% of girls with ID reported at age 14-15 years that they had smoked in the last year (Emerson et al., 2011). The findings of a Taiwanese study by Yen & Lin (2010) indicated that 3.4% of adolescents with ID had experienced smoking and 1.4% had smoked regularly. In a South African study 59.5% of adolescents with ID reported ever having smoked a whole cigarette (Fakier & Wild, 2011).

Several studies reported combined prevalence of smoking in adolescents and adults as follows: less than 10% of individuals with ID residing in different living arrangement in the US (Rimmer, Braddock, & Marks, 1995); 18% of individuals with ID and psychiatric disorders from the US (Hymowitz et al., 1997); 12% of men and 6% of women living in different types of residential provision in the UK (Robertson et al., 2000); 6.2% of attenders at day centers for people with ID in the UK (Taylor et al., 2004); 2.6% of individuals with ID living with families and 2.2% of those living in community homes in Ireland (McGuire, Daly, & Smyth, 2007); 17.3% of the patients with ID in primary care practice in the UK (Gale, Naqvi, & Russ, 2009). American studies on drug use among young adults with ID reported the prevalence of current smoking to be 23% (McGillicuddy & Blane, 1999) and 24% (Rurangirwa et al., 2006). In the review of the literature on drug use among individuals with ID, Chapman & Wu (2012) found that the average past-month prevalence of smoking was 20.5%.

Previous research found a lower prevalence of smoking among individuals with ID than in the general population (Fakier & Wild, 2011; Gress & Boss, 1996; McGillicuddy & Blane, 1999; McGuire et al., 2007; Rimmer et al., 1995; Robertson et al., 2000; Rurangirwa et al., 2006; Taylor et al., 2004). In contrast, Emerson & Turnbull (2005) found that the prevalence of smoking was higher among adolescents with ID. A similar pattern was found in adults in an Australian study by Tracy & Hosken (1997). Comparing adolescents with and without ID, Chapman & Wu (2012) and Taggart et al. (2007) found no differences in the prevalence of smoking, whereas Emerson et al. (2011) found a significantly higher prevalence of smoking in boys with ID but failed to find any difference between girls with ID and the control sample.

A wide range of estimates has been reported for alcohol use among adolescents with ID. Pack, Wallander, & Browne (1998) reported that the lifetime prevalence of alcohol use was 48%, and the prevalence of alcohol use during the past month was 39% among adolescents with ID attending special education classes in the US. The previously mentioned studies reported results as follows: the prevalence of past-year alcohol use ranged from 22.7% to 54.5% and the prevalence of past-month alcohol use ranged from 8.8% to 35.5% (Gress & Boss, 1996); 41% of adolescents with ID had consumed alcohol at some time (Emerson & Turnbull, 2005); 0.6% of adolescents with ID were regular alcohol drinkers (Yen & Lin, (2010); 71.7% of adolescents with ID reported ever having used alcohol (Fakier & Wild, 2011); approximately 20% of children and adolescents with ID living in residential/foster care had used alcohol (Taggart et al., 2007); the prevalence of alcohol use was 29.5% in adolescents with ID and behavioural/emotional problems and 4% in adolescents with ID who were identified as not having behavioural/emotional problems (Taggart et al., 2010).

Studies on adolescents and adults with ID reported the following prevalence rates of alcohol use: less than 5% (Rimmer et al., 1995); 27% to 55% in men and 4% to 24% in women depending on the types of residential provision (Robertson et al., 2000); 24.2% for occasional alcohol use and 10.3% for regular alcohol use (McGuire et al., 2007). A Dutch study on substance use among the clients of ID services revealed that 79.1% of adolescents and adults had used alcohol (VanDerNagel et al., 2011). In the UK study, Taggart et al. (2006) revealed that alcohol was the most commonly used drug among individuals with ID. Among young adults, the current prevalence of alcohol use was 39% in the study by McGillicuddy & Blane (1999) and 25.1% in the study by Rurangirwa et al. (2006). Literature review by Chapman & Wu (2012) found alcohol use prevalence rates of 35.5-47%.

Several studies reported combined prevalence of alcohol and drug use. Findings from a Dutch study by Douma et al. (2007) indicated the prevalence rates of 17.5% for alcohol and drug use in the individuals with ID aged 11 to 24 years. In the US, the prevalence of substance abuse problems was 2.6% in youth with ID aged 12 to 21 years (Slayter, 2010). In the UK, Cooper et al. (2007) found that the prevalence of alcohol/substance use disorder in people with ID aged 16 to 83 years was 1%.

Many researchers found evidence that the prevalence of alcohol use was lower among adolescents with ID in comparison with adolescents without ID (Gress & Boss, 1996; McGillicuddy & Blane, 1999; McGuire et al., 2007; Pack et al., 1998; Rimmer et al., 1995; Robertson et al., 2000; Rurangirwa et al., 2006; VanDerNagel et al., 2011). However, Emerson & Turnbull (2010) reported a lower level of using alcohol at least once a month in adolescents with ID and no differences on lifetime alcohol use between adolescents with and without ID. In the studies by Chapman & Wu (2012), Fakier & Wild (2011) and Taggart et al. (2007) no significant differences were found between participants with and without ID regarding the alcohol use.

The findings from the studies of illicit drug use are also conflicting. Gress & Boss (1996) reported rates of past-year illicit drug use in the range of 1.5-23.9% for marijuana, 0.3-2.9% for cocaine, 2.7-8.3% for amphetamines. They also reported rates of past-month illicit drug use in the range of 0.9-13.8% for marijuana, 0-1.5% for cocaine, 1.1-3.9% for amphetamines. However, data on the use of inhalants are questionable because the past-year prevalence rates (3.8-7.4%) were lower than past-month prevalence rates (1.6-10.4%). According to Pack et al. (1998), the lifetime prevalence of marijuana use was 13%, the past-month prevalence of marijuana use was 10%, and the prevalence of other illicit drug use was very low. Fakier & Wild (2011) reported the following prevalence rates of having ever used illicit drugs: 13.1% for methamphetamine, 34.3% for cannabis, 8% for methaqualone, 11% for inhalants, 5.2% for cocaine, 12% for ecstasy and 6.3% for other

illegal drugs. Other researchers reported the following prevalence estimates of illicit drug use: 10% of children and adolescents with ID in residential/foster care (Taggart et al., 2007); 24.8% of students with ID and behavioral/emotional problems and none of the student with ID and without behavioral/emotional problems (Taggart et al., 2010); 34.8% for alcohol and cannabis, 8% for cannabis, 15.1% for stimulants and 1.2% for opiates (VanDerNagel et al., 2011); 19.4% of substance users with ID used a combination of alcohol and other substances (Taggart et al., 2006); 4% of young adults with ID (McGillicuddy & Blane, 1999); 13% for marijuana use and 1.5% for cocaine use during the past month (Chapman & Wu, 2012).

The results from the studies by Chapman & Wu (2012), McGillicuddy & Blane (1999), Pack et al. (1998) and Taggart et al. (2007) confirmed the less frequent illicit drug use in adolescents with ID. Fakier & Wild (2011) reported that adolescents with ID were more likely to use inhalants, while adolescents without ID were more likely to use methamphetamine and cannabis. VanDerNagel et al. (2011) found a relatively frequent use of cannabis and other drugs among individuals with ID in comparison with the general population.

Several authors have suggested that living arrangement is an important aspect of drug use in people with ID. The results from the studies of predominantly adult samples are consistent in suggesting that living independently or in less restrictive residential settings may be a risk factor for drug use (Hymowitz et al., 1997; Robertson et al., 2000; Taggart et al., 2006; VanDerNagel et al., 2011). However, there are just a few studies comparing drug use in individuals with ID living with their families as opposed to those in a residential facility. Rimmer et al. (1995) found that the prevalence of smoking was lower among individuals with ID living with their family compared with those living in institutions and group homes. The prevalence of alcohol drinking was higher in residents of group homes and lower in residents of institutions compared with those living with their families. Taylor et al. (2004) reported a lower prevalence of smoking in individuals with ID living with their parents in comparison with those living independently and in hospital and staffed housing. Taggart et al. (2006) found that a higher percentage of participants with ID and drug use problems lived with their families than in supported living schemes and residential facilities. Although these studies have indicated an association between living arrangement and drug use, it remains unclear whether drug use is more or less common among adolescents with ID living with their parents in regard to those living in other types of residence.

Adolescents with ID in Serbia are mainly educated in so-called special schools. Currently, more than 4,000 children attend one of the 47 special schools in Serbia (Lazarus, Johnstone, Lazetić, 2012). Although laws enacted in 2009 strongly promote the educational inclusion of all children with disabilities ("Official Gazette RS", No. 72/09), most of the students with ID included

in regular schools are children aged from 7 to 12. It is highly unlikely that many (if any) adolescents with ID were transferred from special to mainstream schools. Some of them live in their family homes, while others were accommodated in boarding schools. Boarding schools provide lodging, food and education to all students during their schooling away from their parents' place of residence. Currently, there are 60 boarding schools with 10,377 users and 1905 employees in Serbia (Statistical Office of the RS, 2011). Few of them are specialised for students with ID.

Data from international studies suggests that drug use in Serbian adolescents is below the average of the European countries. The results from the European School Survey Project on Alcohol and Other Drugs (ESPAD) for 2011 indicated lower levels of lifetime use of cigarettes and illicit drugs, as well as lower levels of current use of cigarettes, alcohol and illicit drugs among Serbian students compared with the average for all European countries (Hibell et al., 2012). However, lifetime use of alcohol and a lifetime non-prescribed use of tranquillisers or sedatives in Serbian students were similar to the ESPAD average. According to the findings from the Global Youth Tobacco Survey (GYTS), the prevalence rate of current smoking among Serbian students was lower than the European average (Baška et al., 2009).

There has been virtually no investigation of cigarette, alcohol and illicit drug use in adolescent with ID in Serbia, so the prevalence is unknown. Hence, further research is needed to increase the understanding of drug use in adolescents with ID so that interventions can be developed. The aims of the present investigation were: (1) to examine the prevalence and patterns of cigarette, alcohol and illicit drug use in adolescents with ID; and (2) to investigate the possible differences in drug use among adolescents living with their parents and those living in boarding schools. Keeping in mind that the majority of the previous research has indicated an increased risk for drug use in people with less severe ID (Chapman & Wu, 2012; Hymowitz et al., 1997; McGillicuddy & Blane, 1999; McGuire et al., 2007; Robertson et al., 2000; Taggart et al., 2006; Taylor et al., 2004), this study included only adolescents with mild ID.

## METHODS

### Participants

The sample consisted of 100 students drawn from four segregated elementary schools for students with ID in Belgrade, Serbia (63% boys and 37% girls, range 13- to 20-years). The inclusion criteria were as follows: 1) aged 13 years and older; 2) intellectual functioning within the range of mild ID (IQ 50-69), according to ICD-10 criteria (World Health Organization, 1993), identified by school psychologists (in most cases by WISC-R); 3) adequate communication skills and ability to respond to Likert Scale measures. Individuals with comorbid mental health issues (dual diagnoses) were excluded from the study. Two separate placement groups were identified, composed of 50 students who lived with their parents and attended non-residential schools (60% boys and 40% girls; mean age 15.62, SD = 1.71) and 50 students enrolled in a boarding school (66% boys and 34% girls, mean age 15.56, SD = 1.78). There were no significant sex or age differences between the two groups.

### Measures

*Demographics.* The participants' age, sex, grade, family, IQ and mental health status were obtained from school authorities.

*Receptive vocabulary.* The Peabody Picture Vocabulary Scale – PPVT-IV (Dunn, Dunn, 2006) provides a measure of single-word receptive vocabulary where the respondent is required to point to the one picture out of four that best illustrates the word.

*Drug use.* Youth Risk Behavior Survey – The YRBS version 2011 is an epidemiological measurement tool to assess the prevalence of adolescent health risk behaviours (CDC, 2011). This study used the Substance use scale to assess a history of using cigarettes (8 questions), alcohol (6 questions), marijuana (4 questions), and cocaine, inhalants, heroin, methamphetamines, ecstasy, steroids and prescription drugs without a doctor's prescription (1 question for each). The internal consistency for this Scale was adequate (Cronbach's $\alpha = .745$).

### Procedures

Informed consent was obtained from all participants, their parents or legal guardians and the school boards. The Headteachers were asked to identify students who have sufficient verbal ability to participate in this study. The research was performed in the second part of the school year. Each participant was informed of the purpose of the study. All of them were also informed of their right to withdraw from the study at any time or to take a break. The examiner emphasised that there were

no right or wrong answers and that their parents, teachers and peers would not be informed of the answers they provided. The testing was conducted in an adequate private room at the students' school.

The order of administration was the PPVT-IV followed by the YRBS. Raw scores for PPVT-IV were converted to standard scores where the mean for the general population is set to be 100 (SD=15). None of the participants had a standard score less than 94. These results, in addition to the Headteachers' opinions on the students' verbal abilities, led us to the conclusion that a student could provide reasonable responses on the YRBS.

All instructions and questions for the YRBS were read to the participants and repeated or reworded if necessary. In addition, cards were provided with response choices written on them. The duration of the procedure was up to 60 minutes per participant.

## RESULTS

Information regarding the adolescents' cigarette use by sex and type of school are presented in Table 1. Out of 100 participants, 49% had tried cigarette smoking (ever); 40% reported smoking an entire cigarette when they were 14 years of age or younger; 34% had smoked on at least one day during the 30 days prior to the study; 8% reported smoking 10 or more cigarettes per day for the past 30 days; 21% reported that they obtained their cigarettes at a local store; 25% reported smoking in the school during the last month; 26% had previously regularly smoked; 24% reported attempting to quit cigarette use during the past 12 months.

The Chi-squared test showed that male participants were more likely than female participants to smoke cigarettes during the past 30 days ($\chi^2$ (1) = 10.984, p = .001); to buy cigarettes in a store ($\chi^2$ (1) = 8.609, p = .002); to smoke cigarettes at school ($\chi^2$ (1) = 6.306, p = .009); to smoke regularly ($\chi^2$ (1) = 4.759, p = .023) and to try to quit smoking ($\chi^2$ (1) = 3.541, p = .048).

Significant differences in cigarette smoking habits were observed between the school types. Compared to students from the non-residential schools, students from the boarding schools were more likely to smoke cigarettes during the past 30 days ($\chi^2$ (1) = 6.417, p = .010); to smoke 10 or more cigarettes per day ($\chi^2$ (1) = 4.891, p = .030); to buy cigarettes in a store ($\chi^2$ (1) = 13.562, p = .000); to smoke cigarettes at school ($\chi^2$ (1) = 15.413, p = .000); to smoke regularly ($\chi^2$ (1) = 10.187, p = .001) and to try to quit smoking ($\chi^2$ (1) = 3.509, p = .050).

Table 1. Cigarette use prevalence and patterns by sex and the type of school, *n* (%)

| | Total | Sex | | | Type of school | | |
|---|---|---|---|---|---|---|---|
| | (*n* = 100) | Male (*n* = 63) | Female (*n* = 37) | $\chi^2$ and p-value | Non-residential (*n* = 50) | Residential (*n* = 50) | $\chi^2$ and p-value |
| Ever used cigarettes | 49 (49.0) | 30 (47.6) | 19 (51.4) | .130 | 24 (48.0) | 25 (50.0) | .040 |
| Age first smoked whole cigarettes < 14 years | 40 (40.0) | 25 (39.7) | 15 (40.5) | .007 | 19 (38.0) | 21 (42.0) | .167 |
| Smoked cigarettes ≥ 1 day during the past 30 days | 34 (34.0) | 29 (46.0) | 5 (13.5) | 10.984*** | 11 (22.0) | 23 (46.0) | 6.417** |
| Smoked ≥ 10 cigarettes per day on the days smoked during the past 30 days | 8 (8.0) | 7 (11.1) | 1 (2.7) | 2.239 | 1 (2.0) | 7 (14.0) | 4.891* |
| Bought cigarettes in a store during the past 30 days | 21 (21.0) | 19 (30.2) | 2 (5.4) | 8.609** | 3 (6.0) | 18 (36.0) | 13.562*** |
| Smoked cigarettes ≥ 1 day on school property during the past 30 days | 25 (21.0) | 21 (33.3) | 4 (10.8) | 6.306** | 4 (8.0) | 21 (42.0) | 15.413*** |
| Ever smoked cigarettes regularly | 26 (26.0) | 21 (33.3) | 5 (13.5) | 4.759* | 6 (12.0) | 20 (40.0) | 10.187*** |
| Tried to quit smoking during the past 12 months | 24 (24.0) | 19 (30.2) | 5 (13.5) | 3.541* | 8 (16.0) | 16 (32.0) | 3.509* |

*p ≤ .05; **p ≤ .01; ***p ≤ .001

Table 2. Alcohol and marijuana use prevalence and patterns by sex and type of school, *n* (%)

| | Total (*n* = 100) | Sex | | | Type of school | | |
|---|---|---|---|---|---|---|---|
| | | Male (*n* = 63) | Female (*n* = 37) | $\chi^2$ and p-value | Non-residential (*n* = 50) | Residential (*n* = 50) | $\chi^2$ and p-value |
| Ever used alcohol | 63 (63.0) | 38 (60.3) | 25 (67.6) | .526 | 31 (62.0) | 32 (62.0) | .043 |
| Age first drank alcohol < 14 years | 45 (45.0) | 26 (41.3) | 19 (51.4) | .957 | 21 (42.0) | 24 (48.0) | .364 |
| Drank alcohol ≥ 1 day during the past 30 days | 14 (14.0) | 8 (12.7) | 6 (16.2) | .240 | 4 (8.0) | 10 (20.0) | 2.990 |
| Had ≥ 5 drinks in a row during the past 30 days | 3 (3.0) | 1 (1.6) | 2 (5.4) | - | 1 (2.0) | 2 (4.0) | - |
| Bought alcohol in a store or bar during the past 30 days | 5 (5.0) | 5 (7.9) | 0 (0) | - | 1 (2.0) | 4 (8.0) | - |
| Drank alcohol ≥ 1 day on school property during the past 30 days | 9 (9.0) | 5 (7.9) | 4 (10.8) | - | 1 (2.0) | 8 (16.0) | 5.983* |
| Ever used marijuana | 4 (4.0) | 3 (4.8) | 1 (2.7) | - | 1 (2.0) | 3 (6.0) | - |
| Age first used marijuana < 14 years | 1 (1.0) | 1 (1.6) | 0 (0) | - | 1 (2.0) | 0 (0) | - |

*p ≤ .05; **p ≤ .01; ***p ≤ .001

Table 2 shows information regarding alcohol and marijuana use by sex and the type of school. For alcohol use, 63% of adolescents reported having had at least one drink during their life; 45% started drinking when they were 14 years of age or younger; 14% consumed alcohol during the past 30 days; 3% reported having five or more drinks on at least one occasion during the past 30 days; 5% obtained the alcohol they drank at a local store or bar; 9% reported that they consumed alcohol at school during the past 30 days. No significant sex difference in alcohol use was detected.

For marijuana use, 4% of participants reported having used marijuana only one or two times in their life; 1 participant reported marijuana use before age 15. Possible sex differences in marijuana use could not be detected due to the rather small number of participants. Adolescents

from the sample did not report the use of cocaine, inhalants, heroin, methamphetamines, ecstasy, steroids and prescription drugs without a doctor's prescription.

In general, students from non-residential and boarding schools did not differ significantly in their alcohol and marijuana use with the exception that boarding school students reported more alcohol use at the school ($\chi^2$ (1) = 5.983, p = .015) than the non-residential students.

## DISCUSSION

The present study sought to extend the empirical literature on drug use in the people with ID by assessing the differences and similarities between adolescents with ID attending a boarding school and those living with their families and attending the non-residential schools, in Serbia.

In regard to cigarette use, the most important findings are that almost one-half of adolescents with mild ID tried smoking cigarettes, in most cases before the age of 15. More than one-quarter of the adolescents were regular smokers, and, during the last 30 days, more than one-third of the adolescents reported smoking cigarettes. The present study revealed a higher prevalence of cigarette trying among adolescents with ID than previous research conducted in the UK (Emerson et al., 2011; Emerson & Turnbull, 2005) and Taiwan (Yen & Lin, 2010), but lower than those found in the South African study (Fakier & Wild, 2011). Within the present study sample a higher proportion of adolescents with ID were reported current smoking in regard to other studies (Gress & Boss, 1996; Emerson et al., 2011; Emerson & Turnbull, 2005; Gale et al., 2009; McGillicuddy & Blane, 1999; McGuire et al., 2007; Rurangirwa et al., 2006; Taylor et al., 2004). The prevalence of current smoking in the present study appeared to be more comparable to prevalence rates for selected subgroups of individuals with ID, such as those living in the residential/foster care (Taggart et al., 2007) and with other mental health problems (Hymowitz et al., 1997; Taggart et al., 2010). A higher percentage of participants in this study were reported regularly smoking (having ever smoked cigarettes daily) in comparison with the studies by McGuire et al. (2007) and Yen & Lin (2010). The present data showed that a large number of adolescents started smoking before the age of 15 years, which is consistent with past research (Hymowitz et al., 1997; Tracy & Hosken, 1997). The prevalence of smoking more than 10 cigarettes per day was higher in regard to other studies (Emerson & Turnbull, 2005; Taylor et al., 2004). The proportion of adolescent smokers who wanted to quit smoking is less than that found in a study by Tracy & Hosken (1997).

The results from the present study suggest that the prevalence of smoking is higher among adolescents with ID than in the general population of adolescents, as Emerson & Turnbull (2005)

and Tracy & Hosken (1997) commented. The report on the ESPAD for 2011 indicated that 41% of the Serbian students had tried cigarettes and 20% of them had smoked during the last 30 days (Hibell et al., 2012). In the GYTS the prevalence rates of current smoking were 12.2% for male and 13.1% for female Serbian students (Baška et al., 2009). Ministry of Health of the RS (2007) reported that among Serbian adolescents 25.5% had tried cigarettes and 10% had smoked regularly.

Compared with girls, boys reported past-month and regular smoking at a significantly higher rate. These findings concur with other literature that also described sex differences in the prevalence of smoking among individuals with ID (Emerson et al., 2011; Gale et al., 2009; McGuire et al., 2007; Rimmer et al., 1995; Robertson et al., 2000; Tracy & Hosken, 1997). In contrast to the present findings, research on general population found no significant differences between boys and girls in the prevalence of current smoking (Baška et al., 2009; Hibell et al., 2012) and regularly smoking (Ministry of Health of the RS, 2007).

The present results show that despite the legal prohibition of smoking in schools in Serbia, one-quarter of the participants reported smoking cigarettes at school, mainly in a residential setting. It should also be noted that in Serbia, the legal age limit for tobacco use is 18 years, but many adolescents with ID bought cigarettes in a store during the last month. The same was true for alcohol. The ESPAD report has presented consistent results regarding the high proportion of Serbian students who bought alcohol in a store, as well as the above average prevalence of having bought alcohol in a bar, disco, etc. (Hibell et al., 2012).

Two-thirds of adolescents with ID reported having at least one drink of alcohol during their lifetime. By comparison with the present results, some authors found significantly lower lifetime rates of alcohol use among adolescents with ID (Emerson & Turnbull, 2005; McGuire et al., 2007; Pack et al., 1998), while others found higher prevalence estimates (Fakier & Wild, 2011; McGillicuddy & Blane, 1999; Rurangirwa et al., 2006). On the other hand, the existing research indicated a higher prevalence of current alcohol use (Gress & Boss, 1996; Pack et al., 1998; Taggart et al., 2007) than that found in the present study.

Compared to ESPAD data (Hibell et al., 2012), the present results indicate a lower lifetime prevalence of alcohol use among adolescents with ID than in the general population (63% vs. 87%), as well as lower rates of past-month alcohol use (14% vs. 52%), drinking five or more drinks in a row (3% vs. 36%) and drinking alcohol at a younger age (45% vs. 55%). These findings are congruent with existing research suggesting lower rates of alcohol use among individuals with ID (Gress & Boss, 1996; McGuire et al., 2007; Pack et al., 1998; Rimmer et al., 1995; Robertson et al., 2000; Rurangirwa et al., 2006).

This study found no differences in the prevalence rates of lifetime and current alcohol use between boys and girls. These results are consistent with the studies by McGillicuddy & Blane (1999) and McGuire et al. (2007), but stand in contrast to the majority of the previous studies that indicated a higher level of alcohol use among males with ID (Cooper et al., 2007; Rimmer et al., 1995; Robertson et al., 2000; Slayter, 2010; Taggart et al., 2006; VanDerNagel et al., 2011). To some extent, the present findings are comparable to the ESPAD study (Hibell et al., 2012). In the general population, as well as among adolescents with ID, no sex difference in the prevalence of lifetime alcohol use was found. However, sex differences in regard to current alcohol use and drunkenness that documented for the general population were not confirmed in adolescents with ID.

The proportion of adolescents who reported marijuana use (4%) is smaller than that presented in earlier studies (Chapman & Wu, 2012; Fakier & Wild, 2011; Gress & Boss, 1996; Pack et al., 1998; Taggart et al., 2006; VanDerNagel et al., 2011). Level of marijuana use among adolescents with ID is lower compared to the lifetime marijuana use prevalence of 7% in the general population found by the ESPAD (Hibell et al., 2012). This finding is in line with the observations by Fakier & Wild (2011), Gress & Boss (1996) and Pack et al. (1998).

The lifetime prevalence of marijuana use was higher for boys than for girls with ID, albeit the small number of participants is problematic for the investigation of the significance of these differences. This is consistent with other research studies on drug use among individuals with ID (Cooper et al., 2007; McGillicuddy & Blane, 1999; Taggart et al., 2006; VanDerNagel et al., 2011). In regard to marijuana use, the ESPAD results also indicated that the prevalence of having ever used marijuana was higher among male than female students (Hibell et al., 2012).

The use of cocaine, inhalants, heroin, methamphetamines, ecstasy, steroids and prescription drugs without a doctor's prescription was not identified in the present sample. Taggart et al. (2010) also failed to find drug use among the sample of adolescents with ID and without behavioral/emotional problems. Other researchers suggested that adolescents with ID were less likely to use drugs compared with the general population (Chapman & Wu, 2012; McGillicuddy & Blane, 1999; Pack et al., 1998; Taggart et al., 2007).

Generally speaking, a higher prevalence of drug use was found among participants living in a residential setting than those living with their parents, but the differences were significant only for smoking. These findings are in line with previous research indicating the low rate of drug use among individuals with ID who lived with their families (Rimmer et al., 1995; Taylor et al., 2004). Similar differences were found between typically developing adolescents living with their parents and those in state care in the studies from the Serbia (Backović et al., 2006), US (Aarons et al.,

2008; Keller, Salazar, & Courtney, 2010; Pilowsky & Wu, 2006; Thompson & Auslander, 2007), UK (McCann et al., 1996) and Germany (Schmid, 2008).

Given the descriptive nature of the study, at present it is not clear which personal and environmental variables contribute to the differences between non-residential and residential students on the variables of interest. Findings from the literature provide some direction as to how to interpret these results, such as less supervision and awareness regarding drug use (Degenhardt, 2000; Rimmer et al., 1995), unqualified staff and less sophisticated procedures for staff support of the residents (Robertson et al., 2000), feelings of isolation and boredom as well excessive amounts of unstructured free time in the lives of people with ID (Taggart et al., 2006). Although causal implications for these findings await further research, this study underscores the increased risk of drug use in adolescents with ID living in residential settings.

The current study has several limitations that should be considered. The sample size was relatively small, and replication with a larger number of adolescents with ID is desirable. Because the data were based on adolescents with mild ID, it is questionable whether the present results can be generalized to individuals with more severe ID. In future research, it will be important to assess drug use in adolescents with different degrees of ID. The detection of drug use was based on the self-reported data of adolescents with ID, which may involve some measurement errors (Brener, Billy, & Grady, 2003; Dolcini et al., 2003; Williams & Nowatzki, 2005). Inclusion of biochemical measures and cross-validation information from parents and teachers can counteract these problems. One of the limitations of this study is that it only included the questions covered by the Youth RiskBehavior Survey, so unfortunately we have no data on possible abuse of pharmaceutical products and use of legal highs or new psychoactive substances. Finally, the present findings are not easily generalisable to other countries due to the specificity of the system of education and the care of adolescents with ID in Serbia.

Notwithstanding these considerations, the present study adds to the emerging body of research on drug use in adolescents with ID and suggests the benefits of including prevention programs in the special education curricula.

## ACKNOWLEDGMENTS

This paper is a result of the project, “Social Participation of Persons with Intellectual Disability”, which was financed by the Ministry of Education, Science and Technological Development of the Republic of Serbia (No. 179017). The authors report no conflicts of interest.

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