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Risk and Protective Factors of Smoking, Drinking, and Drug Use in a Sample of Hungarian Adolescents

Bettina F. Piko

Department of Behavioral Sciences, University of Szeged, H-6722 Szeged, Hungary; fuzne.piko.bettina@med.u-szeged.hu; Tel.: +36-62-420530

Highlights

What are the main findings?

- Psychosomatic symptoms, school achievement, and social support from the family are the most relevant predictors of adolescent substance use.
- Life satisfaction, future orientation, and religiousness are significant protective factors for several types of adolescent substance use.

What are the implications of the main findings?

- Prevention programs for reducing adolescent substance use should include fostering mental health.
- Learning a growth mindset may contribute to the avoidance of substance use and mental health problems as well.

Abstract

Adolescence is a critical life period connected with the initiation of substance use. Exploring the prevalence of and contributors to adolescents' smoking, drinking, and drug use is essential for developing effective health education programs. This study aims to detect prevalence rates of adolescent substance use and their association with sociodemographics and a set of psychological, social, and school-related variables. Participants were high school students (9th graders, N = 1590; 694 males, 896 females) in Békés county, Hungary. The lifetime prevalence rates were the following: smoking (47.2%), alternative smoking (49.2%), drinking (85.7%), cannabis use (7.6%), sedative use (7.0%), and designer drug (herbal) use (3.7%), with gender differences (a surplus of girls) found only in smoking and sedative use. Using bivariate logistic regression analyses, depressive and psychosomatic symptoms and internet addiction increased the odds of all types of substance use, life satisfaction, future orientation, and social support from the family, while school achievement and school satisfaction showed odds-reducing effects. In multivariate analyses, the various types of substance use were predicted by different variables, while psychosomatic symptoms, social support from the family, and school achievement seemed to be the most relevant contributors. Health education programs should also incorporate fostering mental health to prevent adolescent substance use.

Keywords: adolescent substance use; risk and protective factors; smoking; drinking; drug use; future orientation; psychological health

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1. Introduction

Adolescence is a critical developmental stage with an increased level of risk-taking, which makes adolescents vulnerable to the initiation of substance use; the onset of smoking, alcohol, and drug use usually starts before the age of 15 years [1]. Adolescent substance use has not only been associated with lower quality of life but also significantly increases the risk for long-term health problems and early-adulthood substance abuse as well [2]. The European School Survey Project on Alcohol and Other Drugs (ESPAD) aims to periodically collect comparable data among European 16-year-olds to detect trends, risk, and protective factors. Recent data suggest that lifetime alcohol, tobacco, and illicit drug use tend to decline, while new forms of risks arise, such as alternative smoking products or non-medical use of pharmaceutical drugs [3–5]. Besides the national representative sampling, regional studies within a country may provide useful information about the local characteristics and profiles of adolescent substance use in order to develop appropriate health education programs [6]. Therefore, applying a database of a youth study from Békés County, Hungary, in the frame of the Local Collaborative Forum for Drug Issues, the present study focused on adolescent substance use at the age of 16 years, with special attention paid to potential psychological, school-related, and sociodemographic risk and protective factors.

Among the psychological risk factors, poor mental health, like depression or anxiety, often co-occurs with adolescent substance use; youth often use different substances as self-medication for stress and emotional problems [7,8]. Furthermore, adolescent substance use can also serve as a risk factor for the development of neuropsychiatric disorders in adulthood through long-lasting changes in the brain [9]. In most cases, it is a vicious circle: poor mental health can lead to an elevated risk of substance use, while adolescents' substance use can worsen their mental health and quality of life, contributing to later mental disorders [10]. In addition, adolescent substance use may also have an impact on the youth's physical and psychosomatic health [11]. There is a direct association between psychosomatic symptoms (such as headaches, chronic fatigue, or back pain) among adolescents and a number of lifestyle factors, such as nutrition, physical inactivity, alcohol, and tobacco use [12]. Among the psychological correlations, the co-occurrence with different types of substance abuse and addictions should also be mentioned, not only chemical addictions but also behavioral ones, in particular problematic internet use and addiction. An earlier study reported that substance abuse might precede internet addiction [13]. However, another study argued that internet addiction would be an early predictor of substance use (such as alcohol, tobacco, cannabis, or other drugs) [14]. Recently, problematic internet use has been found to be associated with non-prescribed sedatives and painkillers, in addition to illicit drug use [15]. Excessive internet use definitely impairs daily functioning and thus deteriorates adolescents' mental health and well-being, as well as other health-related behaviors.

Among the psychological protective factors, future orientation can especially be highlighted. Future orientation is a mental representation that refers to engaging in future-oriented thinking and acting, anticipating future consequences, and setting future goals and plans, and also having a positive view for the future in general [16]. Future orientation was found to be closely related to positive adolescent development and mental health [17]. For example, it might act as a protective factor against depression [18]. Future orientations were also associated with greater self-reported health behaviors and predicted healthy outcomes [19]. This association is based on the protection motivation theory, namely, its role in adopting protective behaviors by assessing the threat of a risk and motivation to cope with it [20]. Another protective factor may be one's satisfaction with life. Both future orientation and life satisfaction are positive constructs to motivate people to engage in health protection. Youth reporting lower life satisfaction were found to have an elevated likelihood of using tobacco, alcohol, and marijuana [21]. Substance use and satisfaction

with life seem to have synchronous trajectories over time, i.e., as the former decreases, the latter increases, and vice versa [22].

Social support variables have often been reported to serve as protective factors against substance use; however, not all participants of the social network. Adolescents' social networks undergo a fundamental shift from their family toward an increased focus on peers [23]. Their roles are changing, but parents still provide important protection for their children's emotional and moral development, and also parental control and supervision [24]. Thus, not surprisingly, family support tends to decrease the likelihood of adolescent substance use [25]. On the other hand, social support from friends does not necessarily serve as a protection against substance use. Although socializing with peers may positively contribute to adolescent emotional and social development, hanging out with friends appears to be a risk factor for adolescent substance use [26]. A special type of social support, religiousness (connection with God), may also have a role in adolescent substance use: even in secular societies, an inverse relationship has been found [27].

In addition to psychological factors, the school domain may also provide several forms of protection, such as school achievement or satisfaction with school. High school students who abstain from substance use report better academic outcomes as compared with their substance-using peers [28]. Likewise, well-being in school seems to play a significant protective role in adolescent psychological well-being and avoidance of substance use [29].

Finally, we should mention the role of gender and other sociodemographics. Gender differences in adolescent substance use show historical patterns of higher use among boys, but a convergence and even inversion are occurring in some Western countries. Namely, among girls, increasingly higher rates have been detected not only in smoking and alcohol use but also in legal drug misuse [30]. Interestingly, the gender gap in adolescent substance use was found to be smaller in countries with higher levels of gender equality [31]. Even before the COVID-19 era, Hungarian adolescents' substance use, particularly alcohol consumption, was one of the highest in Europe, despite a slow declining tendency in Europe, with disappearing differences between boys and girls in terms of smoking and drinking [32]. Socioeconomic status (SES) is another sociodemographic variable that needs further exploration. While children's information on the family's income or other objective SES measurements might often be biased, SES self-assessment as a subjective evaluation of the family's financial situation compared to an estimated average seems a useful measure of the family's social situation. Studies suggest that this subjective appraisal of socioeconomic status has been robustly associated with health outcomes, even when controlling for the objective financial situation [33]. Studies usually demonstrated an inverse association between socioeconomic status and smoking, including e-cigarettes as well [34,35]. In contrast with these results, children from lower socioeconomic groups reported less substance use [36,37]. This may be explained by affluent families' better financial resources or lower parental monitoring. Especially in Eastern Europe, affluent adolescents had a greater likelihood of weekly alcohol use and binge drinking [38]. On the other hand, an increased risk of adolescent drug use was associated with living in a disadvantaged social environment [39].

In this study, the aim is threefold. First, the aim is to detect prevalence (both lifetime and monthly) rates of adolescent substance use (tobacco use and alternative smoking, alcohol use, binge drinking and drunkenness, cannabis, sedative and designer drug use), also exploring possible gender differences in these behaviors, using the Chi-square test. Second, the aim is to also test their association with a set of psychological and psychosocial (depressive and psychosomatic symptoms, life satisfaction, internet addiction, future orientation, social support, religiousness), school-related (school satisfaction and academic achievement), and sociodemographic (gender, SES self-assessment) variables. In order to

explore the potential risk or protective nature of each variable, the likelihood (odds) of the different types of substance use is calculated, applying bivariate logistic regression analyses. Third, in multivariate analysis, the aim is to explore the most relevant contributors to each type of substance use.

2. Materials and Methods

2.1. Design

This study employed a survey methodology with online data collection in a sample of Hungarian adolescents. Data were collected in May 2024, with the help of local organizers from the Local Collaborative Forum for Drug Issues. A priori, the survey procedure was approved by the Institutional Review Board (IRB) of the Doctoral School of Education, University of Szeged, Hungary (no. 12/2024). The questionnaire took approximately 20–25 min to complete, and was anonymous and voluntary. The survey procedures were approved by the Institutional Review Board (IRB) of the Doctoral School of Education, University of Szeged, Hungary (no. 12/2024). Before data collection, parental informed consent was obtained, giving a clear description of the survey and asking for agreement with their children's participation.

2.2. Participants

The study included 1590 participants: 694 (43.6%) males and 896 (56.4%) females from grade 9 in different high schools, Békés county, Hungary. The aim of this age selection was to comply with the protocol of the European School Survey Project on Alcohol and Other Drugs (ESPAD). Among the participants, four school types were represented: 754 students from secondary modern schools, 526 students from grammar schools, 281 from secondary technical schools, and 29 students from special (e.g., arts) grammar schools.

2.3. Variables and Measures

Beyond sociodemographics, the questionnaire included measurements of psychological scales and school-related variables. SES self-assessment is a subjective construct assessing the family's financial situation compared to an estimated average. A 7-point rating scale was applied to measure SES self-assessment [40]. The responses ranged from 1 = 'among the worst' to 7 = 'highly among the best'. School achievement was measured by the grades the students usually receive in school. Responses varied from 1 = 'mostly 1s and 2s' (Ds and Es in the English system) to 7 = 'mostly 5s' (As). Likewise, the level of school satisfaction was measured with a 7-point scale from 1 = 'not at all happy with school' to 7 = 'very much happy with school' [40]. Religiousness was measured by the importance of religion in one's life, evaluated from 1 = 'not at all important' to 7 = 'very much important' [40].

The measurements of substance use were adapted from the ESPAD (European School Survey Project on Alcohol and Other Drugs) [40]. In terms of the prevalence rates, responses were applied in a dichotomous format (no/yes). In the current study, the following prevalence rates were analyzed: tobacco use and alternative smoking (lifetime and monthly prevalence), alcohol use (lifetime prevalence), binge drinking (minimum of five drinks at a time, monthly prevalence), drunkenness (lifetime and monthly prevalence), and drug consumption, such as cannabis, sedative, and designer drug (namely, herbal) use (lifetime prevalence). Other drug consumptions (e.g., amphetamine, cocaine, heroin, etc.) were also reported, but they were present only in very small amounts.

The Hungarian validated, shortened version of the Children's Depression Inventory (CDI) was applied to measure depressive symptoms [41,42]. The eight-item scale consisted of single symptoms with three statements, e.g., 'I hate myself' (3), 'I do not like myself' (2), 'I like myself' (1). The respondents were to select the statement that most characterized

their feelings during the past two weeks. The final score was coded from 0 to 28, where higher scores indicated higher frequencies of depressive symptoms. The scale was reliable, with a Cronbach's alpha of 0.82 for the current sample.

The following self-reported psychosomatic symptoms were measured to obtain a psychosomatic symptom index: chronic fatigue, tension headache, sleeping problems, palpitations, backache, stomach pyrosis, and tension diarrhea [43]. This index provided information on the frequency of these symptoms during the previous 12 months. Responses were coded from 0 = 'never' to 3 = 'often'. The summary scores varied from 0 to 21, with higher scores reflecting greater frequencies of these symptoms. The index was reliable, with a Cronbach's alpha of 0.83 for the current sample.

The Problematic Internet Use Questionnaire Short-Form (PIUQ-SF-6) was applied to assess levels of internet addiction, containing six items of symptoms like obsession or neglect (e.g., 'How often do you try to conceal the amount of time spent online?') [44]. Participants responded on a 5-point scale from 1 = 'never' to 5 = 'always/almost always'. The summary scores ranged from 6 to 50, with higher scores meaning a greater likelihood of internet addiction. The scale was reliable, with a Cronbach's alpha of 0.77 for the current sample.

The Hungarian validated version of the Satisfaction With Life Scale (SWLS) was applied to assess the students' level of life satisfaction [45,46]. This scale is an indicator of subjective well-being, measuring a global evaluation of one's life satisfaction with five items. Respondents indicated how strongly they agreed with each item (e.g., 'I am satisfied with my life'). The responses varied from 1 = 'strongly disagree' to 7 = 'strongly agree'. Higher scores reflect higher levels of life satisfaction. The Cronbach's alpha coefficient of reliability was 0.90 for the current sample.

The Consideration of Future Consequences Scale measured the students' levels of future orientation [47]. The short Hungarian version of the scale consists of six statements (e.g., 'I only act to satisfy immediate concerns, figuring that I will take care of future problems that may occur at a later date') [48]. The participants indicated how much they agreed with each item, from 1 = 'extremely uncharacteristic of me' to 5 = 'extremely characteristic of me'. The final scores were coded from 6 to 30, where higher scores reflected higher levels of future orientation. The Cronbach's alpha coefficient of reliability for this sample was 0.74.

The Multidimensional Scale of Perceived Social Support (MSPSS) [48], the Hungarian validated version [49,50], was used to assess social support from family and friends. The two subscales contained four items, e.g., 'I get the emotional help and support from my family' (family support), and 'My friends really try to help me' (friend support). The participants indicated how strongly they agreed with each statement, from 1 = 'strongly disagree' to 5 = 'strongly agree'. Higher scores reflected more social support. The Cronbach's alpha coefficient of reliability was 0.90 for each subscale.

2.4. Data Analysis

The data were analyzed using the Statistical Package for Social Sciences (SPSS version 25). First, descriptive statistics were provided for the prevalence rates, with Chi-square tests used to detect group differences by gender. In order to justify the risk or protective nature of the scales and other potential contributors to each type of substance use, binary (bivariate) logistic regression analyses were implemented at the 95% probability. Finally, multivariate regression analyses were applied to detect the most relevant contributors in each case. An odds ratio (OR) > 1.0 indicated a positive association between the factors of interest and the baseline odds (risk factor), while a value < 1.0 indicated the opposite

(protective factor). A maximum *p*-value of 0.05 was used to define statistical significance, and 95% confidence intervals were also calculated for this reason.

3. Results

Table 1 shows descriptive statistics for adolescent substance use in the whole sample and by gender. Frequencies display that 47.2% of the students have ever smoked in their lifetime, while the lifetime prevalence of alternative smoking was 49.2%. Among them, 27.9% smoked cigarettes during the past month, and 32.0% was the monthly prevalence of alternative smoking. The lifetime prevalence of alcohol use was 85.7%, while 39.5% reported binge drinking during the past month. The percentage of ever being drunk was 52.1 (more than half of them), and 22.1% during the past month. In terms of drug use, the lifetime prevalence rates of these were as follows: cannabis (7.6%), sedatives (7.0%), and designer (herbal) drugs (3.7%).

Table 1. Percentage of substance use frequency among adolescents by gender (N = 1590).

	Total (*n*, %)	**Boys (*n*, %)**	**Girls (*n*, %)**	**Chi-Square**
Smoking lifetime	751 (47.2%)	291 (41.9%)	460 (51.3%)	13.890 ($p < 0.001$)
Smoking monthly	444 (27.9%)	177 (25.5%)	267 (29.8%)	3.584 ($p = 0.058$)
Alternative smoking lifetime	783 (49.2%)	302 (43.5%)	481 (53.7%)	15.174 ($p < 0.001$)
Alternative smoking monthly	509 (32.0%)	196 (38.5%)	313 (34.9%)	8.044 ($p = 0.005$)
Alcohol lifetime	1362 (85.7%)	580 (83.6%)	782 (87.3%)	4.366 ($p = 0.037$)
Binge drinking monthly	628 (39.5%)	285 (41.1%)	343 (38.3%)	1.269 ($p = 0.260$)
Being drunk lifetime	829 (52.1%)	362 (52.2%)	467 (52.1%)	0.000 ($p = 0.987$)
Being drunk monthly	352 (22.1%)	150 (21.6%)	202 (22.5%)	0.197 ($p = 0.658$)
Cannabis lifetime	121 (7.6%)	56 (8.1%)	65 (7.3%)	0.369 ($p = 0.543$)
Sedatives lifetime	112 (7.0%)	38 (5.5%)	74 (8.3%)	4.627 ($p = 0.031$)
Designer (herbal) drugs lifetime	59 (3.7%)	31 (4.5%)	28 (3.1%)	1.971 ($p = 0.160$)

There were no gender differences in the prevalence data for binge drinking and drunkenness, cannabis, and herbal drug use ($p > 0.05$). According to the Chi-square tests, more girls reported smoking; in particular, the lifetime prevalence rates were greater among them: 51.3% of girls and 41.9% of boys declared ever smoking [$\chi^2(1, N = 1590) = 13.890$, $p < 0.001$]. A similar association was observed for alternative smoking: 53.7% of girls and 43.5% of boys had ever tried this type of smoking [$\chi^2(1, N = 1590) = 13.890$, $p < 0.001$]. Among the variables of drinking, more girls had ever tried alcohol in their lifetime (87.3%) compared with boys (83.6%) [$\chi^2(1, N = 1590) = 4.366$, $p = 0.037$].

Table 2 shows the results of bivariate logistic regression analyses (odds ratios and 95% confidence intervals) for the smoking variables. In the case of having smoked, all the included variables proved significant predictors, except for social support from friends, while depressive and psychosomatic symptoms, internet use, and gender increased the chance of trying out smoking, satisfaction with life, future orientation, social support from the family, school achievement and school satisfaction, higher ranking of SES self-assessment, and the importance of religion reduced the odds. For the monthly prevalence, the findings were similar, with gender being a nonsignificant predictor. Social support from friends was nonsignificant in either case of smoking variables. In addition, in terms of alternative smoking, SES self-assessment did not show an odds-increasing or odds-reducing effect.

In order to detect the most relevant predictors of each type of substance use, multivariate analyses were introduced. Tolerance and Variance Inflation Factors (VIFs) were calculated to avoid multicollinearity stemming from high correlations between independent

variables in a regression model. The high tolerance values and low (<2.0, with only one variable showing a value of 2.3) VIF values did not indicate high levels of multicollinearity.

Table 2. Bivariate logistic regression estimates (OR) of the smoking variables (N = 1590).

Correlates	Smoking Lifetime		Smoking Monthly		Alternative Smoking Lifetime		Alternative Smoking Monthly	
	B (SE)	OR (95% CI) *p*-Value	B (SE)	OR (95% CI) *p*-Value	B (SE)	OR (95% CI) *p*-Value	B (SE)	OR (95% CI) *p*-Value
Psychosomatic symptoms	0.11 (0.01)	1.12 (1.10; 1.14) $p < 0.001$	0.10 (0.01)	1.11 (1.09; 1.14) $p < 0.001$	0.11 (0.01)	1.12 (1.10; 1.14) $p < 0.001$	0.11 (0.01)	1.12 (1.09; 1.14 $p < 0.001$
Depressive symptoms	0.15 (0.02)	1.16 (1.12; 1.20) $p < 0.001$	0.15 (0.02)	1.16 (1.12; 1.20) $p < 0.001$	0.14 (0.02)	1.15 (1.11; 1.19) $p < 0.001$	0.13 (0.02)	1.14 (1.10; 1.18) $p < 0.001$
Satisfaction with life	−0.06 (0.01)	0.94 (0.93; 0.96) $p < 0.001$	−0.05 (0.01)	0.95 (0.93; 0.96) $p < 0.001$	−0.05 (0.01)	0.95 (0.94; 0.96) $p < 0.001$	−0.05 (0.01)	0.95 (0.94; 0.96) $p < 0.001$
Internet addiction	0.04 (0.01)	1.04 (1.02; 1.07) $p < 0.001$	0.04 (0.01)	1.04 (1.02; 1.07) $p < 0.001$	0.06 (0.01)	1.06 (1.03; 1.08) $p < 0.001$	0.06 (0.01)	1.06 (1.03; 1.09) $p < 0.001$
Future orientation	−0.06 (0.01)	0.94 (0.92; 0.97) $p < 0.001$	−0.07 (0.01)	0.93 (0.90; 0.96) $p < 0.001$	−0.06 (0.01)	0.94 (0.92; 0.97) $p < 0.001$	−0.08 (0.01)	0.92 (0.90; 0.95) $p < 0.001$
Social support from family	−0.06 (0.01)	0.94 (0.93; 0.95) $p < 0.001$	−0.06 (0.01)	0.94 (0.93; 0.95) $p < 0.001$	−0.05 (0.01)	0.95 (0.94; 0.97) $p < 0.001$	−0.05 (0.01)	0.95 (0.94; 0.97) $p < 0.001$
Social support from friends	−0.01 (0.01)	1.00 (0.98; 1.01) $p = 0.590$	−0.01 (0.01)	1.00 (0.98; 1.01) $p = 0.680$	0.01 (0.01)	1.01 (1.00; 1.03) $p = 0.122$	0.01 (0.01)	1.01 (0.99; 1.02) $p = 0.282$
School satisfaction	−0.16 (0.03)	0.86 (0.80; 0.91) $p < 0.001$	−0.21 (0.04)	0.81 (0.75; 0.87) $p < 0.001$	−0.16 (0.03)	0.85 (0.80; 0.91) $p < 0.001$	−0.15 (0.04)	0.86 (0.80; 0.92) $p < 0.001$
School achievement	−0.29 (0.03)	0.75 (0.69; 0.80) $p < 0.001$	−0.37 (0.04)	0.69 (0.64; 0.74) $p < 0.001$	−0.21 (0.03)	0.81 (0.75; 0.86) $p < 0.001$	−0.27 (0.04)	0.76 (0.71; 0.82) $p < 0.001$
Importance of religion	−0.09 (0.03)	0.92 (0.87; 0.97) $p = 0.001$	−0.09 (0.03)	0.91 (0.86; 0.97) $p = 0.003$	−0.08 (0.03)	0.93 (0.88; 0.97) $p = 0.004$	−0.08 (0.03)	0.92 (0.87; 0.98) $p = 0.006$
SES self-assessment	−0.15 (0.05)	0.86 (0.78; 0.95) $p = 0.003$	−0.16 (0.06)	0.85 (0.76; 0.95) $p = 0.006$	−0.10 (0.05)	0.91 (0.82; 1.00) $p = 0.056$	−0.05 (0.06)	0.95 (0.85; 1.06) $p = 0.343$
Gender (reference = boys)	0.38 (0.10)	1.46 (1.20; 1.78) $p < 0.001$	0.21 (0.11)	1.24 (0.99; 1.55) $p = 0.059$	0.41 (0.10)	1.50 (1.23; 1.84) $p < 0.005$	0.31 (0.11)	1.36 (1.10; 1.69) $p = 0.005$

Notes: B = unstandardized regression coefficient, SE = standard error, OR = odds ratio, 95% CI = 95% confidence interval.

Table 3 shows the results for multivariate regression analyses for the smoking variables. While the psychosomatic symptom score, social support from the family, and school achievement remained significant contributors for all types of smoking, depressive symptoms, internet addiction, and school satisfaction lost their significance. Satisfaction with life proved to be a significant correlate of smoking (except for monthly smoking). Future orientation provided protection only against alternative smoking. On the contrary, the importance of religion remained significant in the case of cigarette smoking. SES self-assessment and gender did not play a role in multivariate analyses. However, social support from friends elevated the odds of all types of smoking.

Table 3. Multivariate logistic regression estimates (OR) of the smoking variables (N = 1590).

Correlates	Smoking Lifetime		Smoking Monthly		Alternative Smoking Lifetime		Alternative Smoking Monthly	
	B (SE)	OR (95% CI) *p*-Value	B (SE)	OR (95% CI) *p*-value	B (SE)	OR (95% CI) *p*-Value	B (SE)	OR (95% CI) *p*-Value
Psychosomatic symptoms	0.10 (0.01)	1.11 (1.08; 1.14) $p < 0.001$	0.09 (0.01)	1.10 (1.07; 1.13) $p < 0.001$	0.09 (0.01)	1.10 (1.07; 1.13) $p < 0.001$	0.10 (0.01)	1.10 (1.07; 1.13) $p < 0.001$
Depressive symptoms	0.01 (0.03)	1.00 (0.95; 1.05) $p = 0.935$	0.01 (0.03)	1.01 (0.96; 1.07) $p = 0.651$	0.01 (0.02)	1.01 (0.96; 1.06) $p = 0.849$	−0.01 (0.02)	1.00 (0.95; 1.05) $p = 0.907$
Satisfaction with life	−0.02 (0.01)	0.98 (0.96; 0.99) $p < 0.030$	−0.01 (0.01)	0.99 (0.97; 1.01) $p = 0.487$	−0.02 (0.01)	0.97 (0.95; 0.99) $p = 0.014$	−0.05 (0.01)	0.97 (0.95; 0.99) $p = 0.023$

Table 3. *Cont.*

Correlates	Smoking Lifetime		Smoking Monthly		Alternative Smoking Lifetime		Alternative Smoking Monthly	
	B (SE)	OR (95% CI) *p*-Value	B (SE)	OR (95% CI) *p*-value	B (SE)	OR (95% CI) *p*-Value	B (SE)	OR (95% CI) *p*-Value
Internet addiction	0.02 (0.01)	0.98 (0.96; 1.01) $p = 0.226$	−0.01 (0.01)	0.99 (0.96; 1.01) $p = 0.350$	0.01 (0.01)	1.01 (0.98; 1.03) $p = 0.724$	0.06 (0.01)	1.01 (0.98; 1.04) $p = 0.594$
Future orientation	−0.02 (0.02)	0.98 (0.95; 1.01) $p = 0.259$	−0.03 (0.02)	0.97 (0.94; 1.01) $p = 0.141$	−0.05 (0.02)	0.95 (0.92; 0.98) $p = 0.001$	−0.08 (0.01)	0.92 (0.90; 0.95) $p < 0.001$
Social support from family	−0.04 (0.01)	0.96 (0.94; 0.98) $p < 0.001$	−0.04 (0.01)	0.96 (0.94; 0.98) $p < 0.001$	−0.02 (0.01)	0.97 (0.95; 0.99) $p = 0.014$	−0.05 (0.01)	0.95 (0.94; 0.97) $p = 0.017$
Social support from friends	0.03 (0.01)	1.03 (1.01; 1.05) $p < 0.001$	0.04 (0.01)	1.04 (1.02; 1.04) $p < 0.001$	0.05 (0.01)	1.05 (1.03; 1.07) $p < 0.001$	0.05 (0.01)	1.05 (1.03; 1.07) $p < 0.001$
School satisfaction	0.04 (0.04)	1.04 (0.96; 1.13) $p = 0.139$	−0.01 (0.05)	0.99 (0.90; 1.08) $p = 0.754$	0.01 (0.04)	1.01 (0.83; 1.09) $p = 0.888$	0.03 (0.04)	1.03 (0.94; 1.12) $p = 0.505$
School achievement	−0.26 (0.04)	0.77 (0.71; 0.83) $p < 0.001$	−0.33 (0.04)	0.72 (0.66; 0.78) $p < 0.001$	−0.17 (0.03)	0.84 (0.78; 0.91) $p < 0.001$	−0.22 (0.04)	0.80 (0.75; 0.87) $p < 0.001$
Importance of religion	−0.07 (0.03)	0.94 (0.88; 0.99) $p = 0.025$	−0.07 (0.03)	0.93 (0.88; 0.99) $p = 0.043$	−0.05 (0.03)	0.95 (0.90; 1.05) $p = 0.073$	−0.05 (0.03)	0.95 (0.89; 1.01) $p = 0.081$
SES self-assessment	0.05 (0.06)	1.06 (0.94; 1.18) $p = 0.343$	0.05 (0.06)	1.05 (0.92; 1.19) $p = 0.463$	0.09 (0.06)	1.10 (0.98; 1.23) $p = 0.112$	0.16 (0.06)	1.17 (1.04; 1.32) $p = 0.010$
Gender (reference = boys)	−0.04 (0.12)	0.96 (0.95; 1.21) $p = 0.714$	−0.24 (0.14)	0.79 (0.60; 1.03) $p = 0.081$	−0.06 (0.12)	0.95 (0.75; 1.20) $p = 0.644$	−0.16 (0.13)	0.85 (0.66; 1.10) $p = 0.211$
χ^2		237.37 *		225.28 *		204.28 *		206.91 *
df		12		12		12		12
Nagelkerke R^2		0.18		0.19		0.16		0.17

Notes: B = unstandardized regression coefficient, SE = standard error, OR = odds ratio, 95% CI = 95% confidence interval, * $p < 0.001$.

Table 4 presents the results of bivariate logistic regression analyses for the drinking variables. All of the psychological variables proved significant predictors, except for future orientation in the case of ever drinking. Likewise, school achievement was not a significant correlate of drinking. Similar to the smoking variables, social support from friends, as well as SES self-assessment, neither increased nor reduced the odds of drinking variables. The importance of religion was not a relevant contributor to adolescent drinking, except for monthly drunkenness. Finally, gender was a significant predictor only for lifetime drinking.

Table 4. Bivariate logistic regression estimates (OR) of the drinking variables (N = 1590).

Correlates	Alcohol Lifetime		Binge Drinking Monthly		Being Drunk Lifetime		Being Drunk Monthly	
	B (SE)	OR (95% CI) *p*-Value	B (SE)	OR (95% CI) *p*-Value	B (SE)	OR (95% CI) *p*-Value	B (SE)	OR (95% CI) *p*-Value
Psychosomatic symptoms	0.12 (0.02)	1.13 (1.09; 1.16) $p < 0.001$	0.07 (0.01)	1.07 (1.05; 1.09) $p < 0.001$	0.11 (0.01)	1.12 (1.09; 1.14) $p < 0.001$	0.09 (0.01)	1.12 (1.07; 1.12 $p < 0.001$
Depressive symptoms	0.06 (0.02)	1.06 (1.01; 1.11) $p = 0.023$	0.06 (0.02)	1.06 (1.03; 1.10) $p < 0.001$	0.10 (0.02)	1.11 (1.07; 1.14) $p < 0.001$	0.12 (0.02)	1.12 (1.08; 1.17) $p < 0.001$
Satisfaction with life	−0.04 (0.01)	0.96 (0.94; 0.98) $p < 0.001$	−0.03 (0.01)	0.97 (0.96; 0.98) $p < 0.001$	−0.04 (0.01)	0.96 (0.95; 0.98) $p < 0.001$	−0.04 (0.01)	0.96 (0.95; 0.98) $p < 0.001$
Internet addiction	0.08 (0.02)	1.08 (1.04; 1.12) $p < 0.001$	0.05 (0.01)	1.05 (1.02; 1.07) $p < 0.001$	0.05 (0.01)	1.05 (1.03; 1.08) $p < 0.001$	0.06 (0.01)	1.07 (1.04; 1.09) $p < 0.001$
Future orientation	−0.02 (0.02)	0.98 (0.95; 1.02) $p = 0.375$	−0.06 (0.01)	0.94 (0.92; 0.97) $p < 0.001$	−0.04 (0.01)	0.96 (0.93; 0.98) $p = 0.001$	−0.08 (0.02)	0.92 (0.89; 0.95) $p < 0.001$
Social support from family	−0.04 (0.01)	0.96 (0.94; 0.98) $p = 0.001$	−0.03 (0.01)	0.97 (0.96; 0.98) $p < 0.001$	−0.04 (0.01)	0.96 (0.95; 0.97) $p < 0.001$	−0.04 (0.01)	0.96 (0.94; 0.97) $p < 0.001$
Social support from friends	0.01 (0.01)	1.00 (0.98; 1.02) $p = 0.659$	0.01 (0.01)	1.01 (1.00; 1.03) $p = 0.074$	0.01 (0.01)	1.00 (0.99; 1.02) $p = 0.667$	0.01 (0.01)	1.01 (0.99; 1.03) $p = 0.178$

Table 4. *Cont.*

Correlates	Alcohol Lifetime		Binge Drinking Monthly		Being Drunk Lifetime		Being Drunk Monthly	
	B (SE)	**OR (95% CI) *p*-Value**	**B (SE)**	**OR (95% CI) *p*-Value**	**B (SE)**	**OR (95% CI) *p*-Value**	**B (SE)**	**OR (95% CI) *p*-Value**
School satisfaction	−0.14 (0.05)	0.87 (0.79; 0.96) $p = 0.006$	−0.12 (0.03)	0.89 (0.83; 0.95) $p = 0.001$	−0.17 (0.03)	0.84 (0.79; 0.90) $p < 0.001$	−0.11 (0.04)	0.90 (0.83; 0.97) $p = 0.009$
School achievement	−0.03 (0.05)	0.97 (0.88; 1.06) $p = 0.477$	−0.19 (0.03)	0.83 (0.77; 0.89) $p < 0.001$	−0.16 (0.03)	0.85 (0.80; 0.91) $p < 0.001$	−0.15 (0.04)	0.86 (0.80; 0.93) $p < 0.001$
Importance of religion	−0.05 (0.04)	0.95 (0.88; 1.02) $p = 0.144$	−0.05 (0.03)	0.95 (0.90; 1.01) $p = 0.091$	−0.03 (0.03)	0.97 (0.92; 1.02) $p = 0.232$	−0.07 (0.03)	0.93 (0.87; 0.99) $p = 0.026$
SES self-assessment	−0.11 (0.07)	0.90 (0.78; 1.03) $p = 0.131$	−0.05 (0.05)	1.05 (0.96; 1.16) $p = 0.346$	0.01 (0.05)	1.00 (0.91; 1.11) $p = 0.901$	0.07 (0.06)	1.08 (0.96; 1.21) $p = 0.220$
Gender (reference = boys)	0.30 (0.14)	1.35 (1.02; 1.79) $p = 0.037$	−0.12 (0.10)	0.89 (0.73; 1.09) $p = 0.260$	−0.01 (0.10)	1.00 (0.82; 1.22) $p = 0.987$	0.05 (0.12)	1.06 (0.83; 1.34) $p = 0.658$

Notes: B = unstandardized regression coefficient, SE = standard error, OR = odds ratio, 95% CI = 95% confidence interval.

Table 5 presents the results for multivariate regression analyses for alcohol use. Similar to smoking, the psychosomatic symptom score remained significant in all cases, while depression, satisfaction with life, and school satisfaction became nonsignificant. The importance of religion was not an important predictor, while school played only a limited role. As a common feature with smoking, social support from the family elevated while social support from friends decreased the odds of alcohol use (except for lifetime prevalence). However, in contrast with smoking, higher SES contributed to elevated odds of drinking. Internet addiction elevated the odds of alcohol use, but it was significant only in terms of lifetime prevalence.

Subsequently, the study explored which variables might have an odds-reducing or odds-increasing effect on drug use. These results can be seen in Table 6. While depressive and psychosomatic symptoms and internet use proved to be risk factors, satisfaction with life, future orientation, social support from friends and the family, school achievement, and school satisfaction were protective factors. In addition, the importance of religion reduced the odds of cannabis use. In connection with the lifetime prevalence of sedative use, being a girl was a risk factor, while higher SES ranking scores provided protection.

Table 5. Multivariate logistic regression estimates (OR) of the drinking variables (N = 1590).

Correlates	Alcohol Lifetime		Binge Drinking Monthly		Being Drunk Lifetime		Being Drunk Monthly	
	B (SE)	**OR (95% CI) *p*-Value**	**B (SE)**	**OR (95% CI) *p*-Value**	**B (SE)**	**OR (95% CI) *p*-Value**	**B (SE)**	**OR (95% CI) *p*-Value**
Psychosomatic symptoms	0.12 (0.02)	1.13 (1.09; 1.18) $p < 0.001$	0.08 (0.01)	1.08 (1.05; 1.11) $p < 0.001$	0.12 (0.01)	1.13 (1.10; 1.16) $p < 0.001$	0.09 (0.01)	1.09 (1.06; 1.12 $p < 0.001$
Depressive symptoms	−0.13 (0.04)	0.88 (0.81; 1.00) $p = 0.072$	−0.05 (0.02)	0.95 (0.91; 1.01) $p = 0.071$	−0.03 (0.03)	0.97 (0.92; 1.02) $p = 0.210$	0.02 (0.03)	1.02 (0.96; 1.08) $p = 0.542$
Satisfaction with life	−0.03 (0.01)	0.97 (0.94; 0.99) $p = 0.040$	−0.02 (0.01)	0.98 (0.96; 1.00) $p = 0.086$	−0.01 (0.01)	0.99 (0.97; 1.01) $p = 0.351$	−0.02 (0.01)	0.98 (0.96; 1.00) $p = 0.113$
Internet addiction	0.04 (0.02)	1.04 (1.01; 1.09) $p = 0.028$	−0.05 (0.02)	1.02 (0.99; 1.05) $p = 0.081$	0.01 (0.01)	1.01 (0.98; 1.04) $p = 0.439$	0.03 (0.01)	1.03 (1.00; 1.06) $p = 0.059$
Future orientation	−0.01 (0.02)	0.99 (0.94; 1.04) $p = 0.732$	−0.06 (0.01)	0.95 (0.92; 0.98) $p = 0.002$	−0.03 (0.02)	0.97 (0.47; 1.00) $p = 0.051$	−0.07 (0.02)	0.93 (0.90; 0.97) $p < 0.001$
Social support from family	−0.03 (0.01)	0.97 (0.94; 1.00) $p = 0.068$	−0.02 (0.01)	0.98 (0.96; 0.99) $p = 0.021$	−0.03 (0.01)	0.97 (0.95; 0.98) $p = 0.001$	−0.02 (0.01)	0.98 (0.95; 0.99) $p = 0.033$
Social support from friends	0.02 (0.01)	1.02 (0.99; 1.05) $p = 0.109$	0.04 (0.01)	1.05 (1.03; 1.07) $p < 0.001$	0.03 (0.01)	1.03 (1.01; 1.05) $p = 0.001$	0.05 (0.01)	1.05 (1.02; 1.07) $p < 0.001$

Table 5. *Cont.*

Correlates	Alcohol Lifetime		Binge Drinking Monthly		Being Drunk Lifetime		Being Drunk Monthly	
	B (SE)	OR (95% CI) *p*-Value	B (SE)	OR (95% CI) *p*-Value	B (SE)	OR (95% CI) *p*-Value	B (SE)	OR (95% CI) *p*-Value
School satisfaction	−0.06 (0.06)	0.94 (0.94; 1.05) $p = 0.276$	−0.02 (0.04)	0.98 (0.90; 1.06) $p = 0.551$	−0.05 (0.04)	0.95 (0.95; 0.91) $p = 0.208$	0.05 (0.05)	1.05 (0.95; 1.15) $p = 0.311$
School achievement	0.02 (0.05)	1.02 (0.99; 1.05) $p = 0.716$	−0.14 (0.04)	0.87 (0.80; 0.93) $p < 0.001$	−0.10 (0.04)	0.91 (0.88; 0.98) $p = 0.013$	−0.08 (0.05)	0.92 (0.84; 1.01) $p = 0.081$
Importance of religion	−0.04 (0.04)	0.95 (0.88; 1.03) $p = 0.264$	−0.04 (0.03)	0.96 (0.91; 1.02) $p = 0.193$	−0.02 (0.03)	0.98 (0.93; 1.04) $p = 0.536$	−0.05 (0.03)	0.95 (0.89; 1.01) $p = 0.126$
SES self-assessment	0.02 (0.08)	1.02 (0.88; 1.19) $p = 0.754$	0.18 (0.06)	1.19 (1.07; 1.34) $p = 0.002$	0.16 (0.06)	1.17 (1.05; 1.31) $p = 0.005$	0.25 (0.07)	1.28 (1.12; 1.46) $p < 0.001$
Gender (reference = boys)	−0.12 (0.16)	0.89 (0.64; 1.22) $p = 0.471$	−0.49 (0.10)	0.90 (0.83; 1.07) $p = 0.261$	−0.01 (0.10)	1.01 (0.80; 1.20) $p = 0.587$	−0.04 (0.11)	1.06 (0.90; 1.04) $p = 0.480$
χ^2	87.57 *		133.55 *		182.88 *		139.49 *	
df	12		12		12		12	
Nagelkerke R^2	0.10		0.11		0.14		0.13	

Notes: B = unstandardized regression coefficient, SE = standard error, OR = odds ratio, 95% CI = 95% confidence interval, * $p < 0.001$.

Table 6. Bivariate logistic regression estimates (OR) of the drug-use variables (N = 1590).

Correlates	Cannabis Lifetime		Sedatives Lifetime		Designer (Herbal) Drug Lifetime	
	B (SE)	OR (95% CI) *p*-Value	B (SE)	OR (95% CI) *p*-Value	B (SE)	OR (95% CI) *p*-Value
Psychosomatic symptoms	0.09 (0.02)	1.10 (1.06; 1.14) $p < 0.001$	0.13 (0.02)	1.14 (1.10; 1.18) $p < 0.001$	0.09 (0.03)	1.09 (1.04; 1.15) $p < 0.001$
Depressive symptoms	0.14 (0.03)	1.15 (1.09; 1.21) $p < 0.001$	0.21 (0.03)	1.24 (1.17; 1.31) $p < 0.001$	0.17 (0.04)	1.18 (1.10; 1.27) $p < 0.001$
Satisfaction with life	−0.08 (0.01)	0.92 (0.90; 0.94) $p < 0.001$	−0.10 (0.01)	0.90 (0.88; 0.93) $p < 0.001$	−0.09 (0.02)	0.91 (0.88; 0.94) $p < 0.001$
Internet addiction	0.05 (0.02)	1.06 (1.02; 1.10) $p = 0.005$	0.11 (0.02)	1.13 (1.07; 1.15) $p < 0.001$	0.08 (0.02)	1.08 (1.03; 1.14) $p = 0.002$
Future orientation	−0.12 (0.02)	0.89 (0.84; 0.93) $p < 0.001$	−0.11 (0.03)	0.90 (0.85; 0.96) $p < 0.001$	−0.13 (0.03)	0.88 (0.82; 0.94) $p < 0.001$
Social support from family	−0.08 (0.02)	0.92 (0.90; 0.94) $p < 0.001$	−0.11 (0.01)	0.90 (0.88; 0.92) $p < 0.001$	−0.11 (0.02)	0.89 (0.86; 0.92) $p < 0.001$
Social support from friends	−0.06 (0.01)	0.94 (0.92; 0.96) $p < 0.001$	−0.06 (0.01)	0.94 (0.92; 0.96) $p < 0.001$	−0.08 (0.02)	0.93 (0.90; 0.96) $p < 0.001$
School satisfaction	−0.30 (0.06)	0.74 (0.65; 0.84) $p < 0.001$	−0.22 (0.06)	0.80 (0.71; 0.91) $p = 0.001$	−0.23 (0.09)	0.80 (0.67; 0.95) $p = 0.009$
School achievement	−0.34 (0.06)	0.71 (0.63; 0.80) $p < 0.001$	−0.25 (0.06)	0.78 (0.69; 0.88) $p < 0.001$	−0.42 (0.09)	0.66 (0.55; 0.78) $p < 0.001$
Importance of religion	−0.11 (0.05)	0.89 (0.80; 0.99) $p = 0.034$	−0.10 (0.05)	0.90 (0.81; 1.00) $p = 0.059$	0.01 (0.07)	1.00 (0.88; 1.15) $p = 0.961$
SES self-assessment	−0.17 (0.10)	0.84 (0.70; 1.02) $p = 0.082$	−0.39 (0.10)	0.67 (0.55; 0.83) $p < 0.001$	−0.13 (0.14)	0.87 (0.67; 1.14) $p = 0.321$
Gender (reference = boys)	−0.11 (0.19)	0.89 (0.61; 1.29) $p = 0.544$	0.44 (0.21)	1.55 (1.04; 2.33) $p = 0.033$	−0.37 (0.27)	0.69 (0.41; 1.16) $p = 0.163$

Notes: B = unstandardized regression coefficient, SE = standard error, OR = odds ratio, 95% CI = 95% confidence interval.

Finally, the study explored which variables might be the most relevant contributors to drug use. These results can be seen in Table 7. Similar to smoking and drinking, the psychosomatic symptom score, school achievement (except for sedative use), and social support from the family remained significant contributors. School achievement was a

significant predictor of cannabis and herbal use. Internet addiction elevated the odds of sedative use. Being a girl lowered the odds of illegal drug use.

Table 7. Multivariate logistic regression estimates (OR) of the drug-use variables (N = 1590).

	Cannabis Lifetime		Sedatives Lifetime		Designer (Herbal) Drug Lifetime	
Correlates	**B (SE)**	**OR (95% CI) *p*-Value**	**B (SE)**	**OR (95% CI) *p*-Value**	**B (SE)**	**OR (95% CI) *p*-Value**
Psychosomatic symptoms	0.10 (0.02)	1.10 (1.05; 1.15) $p < 0.001$	0.09 (0.02)	1.10 (1.05; 1.15) $p < 0.001$	0.09 (0.03)	1.09 (1.03; 1.16) $p = 0.005$
Depressive symptoms	−0.06 (0.04)	0.94 (0.87; 1.02) $p = 0.137$	0.01 (0.04)	1.00 (0.93; 1.09) $p = 0.855$	−0.01 (0.05)	1.00 (0.89; 1.11) $p = 0.935$
Satisfaction with life	−0.03 (0.02)	0.97 (0.93; 1.00) $p = 0.072$	−0.03 (0.02)	0.97 (0.93; 1.01) $p = 0.149$	−0.01 (0.02)	0.99 (0.94; 1.04) $p = 0.675$
Internet addiction	0.01 (0.02)	1.02 (0.97; 1.06) $p = 0.478$	0.06 (0.02)	1.06 (1.02; 1.10) $p = 0.009$	0.05 (0.03)	1.05 (0.99; 1.11) $p = 0.094$
Future orientation	−0.05 (0.03)	0.95 (0.90; 1.00) $p = 0.078$	−0.03 (0.03)	0.97 (0.91; 1.02) $p = 0.248$	−0.04 (0.04)	0.96 (0.89; 1.03) $p = 0.285$
Social support from family	−0.04 (0.02)	0.96 (0.93; 0.99) $p = 0.029$	−0.04 (0.02)	0.94 (0.91; 0.97) $p = 0.001$	−0.08 (0.02)	0.92 (0.88; 0.97) $p = 0.001$
Social support from friends	−0.02 (0.01)	0.98 (0.95; 1.01) $p = 0.206$	−0.02 (0.01)	0.98 (0.95; 1.00) $p = 0.176$	−0.02 (0.02)	0.97 (0.94; 1.01) $p = 0.216$
School satisfaction	−0.07 (0.07)	0.93 (0.80; 1.07) $p = 0.313$	0.10 (0.08)	1.10 (0.95; 1.28) $p = 0.211$	0.06 (0.10)	1.07 (0.87; 1.30) $p = 0.526$
School achievement	−0.20 (0.07)	0.82 (0.72; 0.94) $p = 0.004$	−0.07 (0.07)	0.94 (0.72; 0.94) $p = 0.361$	−0.28 (0.10)	0.76 (0.62; 0.92) $p = 0.005$
Importance of religion	−0.08 (0.06)	0.92 (0.82; 1.02) $p = 0.127$	−0.04 (0.06)	0.96 (0.85; 1.07) $p = 0.434$	0.05 (0.07)	1.05 (0.91; 1.21) $p = 0.521$
SES self-assessment	0.07 (0.11)	1.08 (0.88; 1.32) $p = 0.477$	−0.09 (0.11)	0.91 (0.73; 1.13) $p = 0.401$	0.15 (0.14)	1.16 (0.87; 1.54) $p = 0.303$
Gender (reference = boys)	−0.53 (0.22)	0.59 (0.38; 0.91) $p = 0.017$	−015 (0.24)	0.86 (0.54; 1.38) $p = 0.530$	−0.84 (0.31)	0.43 (0.23; 0.79) $p = 0.007$
χ^2	103.33 *		123.23 *		76.71 *	
df	12		12		12	
Nagelkerke R^2	0.15		0.19		0.17	

Notes: B = unstandardized regression coefficient, SE = standard error, OR = odds ratio, 95% CI = 95% confidence interval, * $p < 0.001$.

4. Discussion

Adolescent substance use is a critical public health challenge. It is a major risk factor for long-term health problems, acting as a significant driver of the global disease burden [1]. There is a high need for updated information on adolescent substance use, including in local areas (such as counties), beyond the national representative surveys (e.g., ESPAD). Therefore, the studied sample consisted of grade nine (16-year-old) high school students from Békés county, Hungary, in order to help develop school-based health education programs. Besides the traditional types of substance use, such as cigarette smoking and alcohol use, the study also included questions on alternative smoking, sedative, and designer (herbal) drug use. Due to the questionnaires being compatible with the ESPAD protocols, the data are comparable with national and international data as well.

In Hungary, despite a declining trend in tobacco use, the lifetime prevalence of cigarette smoking was 51% in 2024, based on the national representative sampling (https://www.euda.europa.eu/publications/data-factsheets/espad-2024-key-findings_hu, accessed on 10 September 2025), whereas it was 47.2% in this study sample. A surplus of smoking girls could be detected in both samples. Social, cultural, and environmental factors may play a role in this tendency, e.g., a greater level of social acceptance of female substance

use compared to past attitudes [51]. This trend could also be noticed in terms of drinking: similar to cigarette smoking, traditionally, alcohol use was associated more with males, linking it to masculinity in societal norms and media portrayals [52]. Now, there is a recent data shift in drinking patterns across genders. Students from the studied sample reported extremely high prevalence rates of alcohol use, binge drinking, and even drunkenness: the lifetime prevalence of alcohol use was 85.7%, the monthly prevalence of binge drinking was 39.5%, and the lifetime prevalence of drunkenness was 52.1% at the age of 16 (i.e., underage drinking). Adolescents' alcohol consumption is more common in Eastern Europe compared to Western European peers, and the study data are above the national representative survey data (ESPAD) [3]. Besides cigarette smoking and drinking, the popularity of alternative smoking (such as e-cigarettes) represents a new concern, being associated with increased nicotine use and obstructive lung function impairment, in addition to their highly addictive nature [53]. The findings of this study are in line with the European trends, with an increasing prevalence of these new types of smoking: nearly half of the students (49.2%) had ever tried them, and 32.0% had used them during the past month. These frequencies correspond to the Hungarian national representative data. Illicit drug use showed lower prevalence in the studied sample than the European average or the Hungarian ESPAD survey, while similar values were found in terms of sedative use [3].

Among the risk factors, depressive and psychosomatic symptoms, as well as internet addiction, were consequently found to increase the odds of all types of substance use. These findings are in concordance with previous research results [7,8,12,14,15]. In addition, being a female may elevate the likelihood of lifetime prevalence of drinking and sedative use, and all types of smoking. Although adolescent substance use can help alleviate unwanted mental health symptoms like hopelessness, anxiety, irritability, and negative thoughts, in the long term, it can lead to deteriorating mental health and addiction [8]. Girls in particular are at high risk for mental disorders, and the greater prevalence of their substance use may trigger these negative consequences [54].

Among the protective factors, school achievement, school satisfaction, satisfaction with life, and future orientation showed odds-reducing effects for all types of adolescent substance use, similar to previous studies [19,21,28,29]. Further, social support from the family seemed to provide strong protection against adolescent substance use. The protective nature of one's family may stem from parental control and providing a warm and trusting home environment and open communication for the teenagers [25,55]. Thus, parents can play a significant role in preventing and responding to adolescent substance use by establishing healthy boundaries and encouraging positive behaviors [19,21,28,29]. The role of social support from friends is more Janus-faced. Peers can play a significant role in adolescent mental health, providing emotional support, a social network, and a sense of belonging, all of which lead to the development of resilience that fosters positive psychological outcomes [56]. However, peers do not necessarily behave in a positive way, and negative peer pressure often leads to adolescent substance use [26]. Interestingly, the association of peer support with drug use was significant, with a lower likelihood.

Despite living in a highly secular society, the importance of religion did play a role in adolescents' smoking, monthly prevalence of drunkenness, and cannabis use, in line with a previous study [27]. These results support that religiosity generally may act as a protective factor against adolescent substance use through fostering self-regulation, strengthening sincere social ties, and promoting engagement in preventive health behaviors [57]. Since these associations are not conclusive in each type of substance use, the issue of religion as it relates to the other factors and experimentation versus chronic use is also worthy of more detailed exploration in the future.

The role of socioeconomic status is rather ambiguous: several studies report a greater likelihood of substance use among youth from families with higher SES, while others show reverse results [34–37]. Obviously, the parents' educational levels emerge as a more critical determinant than family affluence [58]. The findings of this study suggest that higher SES (as evaluated by self-assessment) had an odds-reducing effect on adolescent smoking (but not alternative smoking) and sedative use. In connection with alcohol, no significant associations could be justified in bivariate associations. The smoking rate is usually higher among adolescents from lower social classes [34]. In addition, Békés County is a relatively disadvantaged region in Hungary from an economic point of view. However, an association with alternative smoking could not be justified.

Multivariate analyses highlight several important common features as well as differences in the predictor structure of various types of substance use. First, psychosomatic symptoms, school achievement (except for sedative use and alcohol lifetime prevalence), and social support from the family seem universal predictors. Satisfaction with life also proved a significant correlate of smoking (except for monthly smoking). While future orientation provided protection only against alternative smoking, the importance of religion remained a significant contributor to cigarette smoking. In terms of alcohol use, higher SES elevated the odds of binge drinking and drunkenness. The relationship between SES and alcohol consumption in adolescence has been found to be inconclusive [59]. However, in several countries (including Hungary), it has been reported that adolescents from a high SES background had a higher chance of drinking than those from a low SES background [59]. Not surprisingly, social support from friends elevated the odds of smoking and drinking, similar to previous findings [26]. Finally, internet addiction remained a positive contributor to sedative use, while future orientation lowered the odds of alternative smoking and several indicators of alcohol use. It should be noted here, however, that these associations do not reflect causal inference (e.g., internet addiction can also cause substance use), but they may be due to shared vulnerability (e.g., negative affect, parental monitoring, unstructured time, etc.).

Overall, the findings of this study highlight not only the current prevalence rates of adolescent substance use but also its potential risk and protective factors, detecting the most relevant contributors to each type of substance use. This is a strength of this paper, in addition to providing updated information about substance use in a representative sample of adolescents living in a specific region of Hungary. Notable findings of interest reported include the relatively high alcohol and nicotine prevalence and low drug use among Hungarian youth relative to other countries/regions. The elevated substance use among girls relative to boys is also noteworthy. The relatively large and broad sample of youth and regional focus can inform local prevention and intervention efforts based on a strong rationale and premise. Validated scales and measurements that have been widely used in international and national studies (i.e., ESPAD) were applied in this study; therefore, the prevalence rates are suitable for comparison purposes. However, several limitations should be mentioned. First, self-reported data on substance use always raise the question of their validity. Since the survey was anonymous and confidential, data could not be handled by persons to whom they were not relevant. Thus, it is likely that the students felt comfortable providing valid information about their substance use. Second, due to the cross-sectional study design, the analyses did not provide a causal relationship. In addition, these relationships, e.g., with the psychological variables, are more bidirectional instead of a simple causal effect. Nevertheless, causation is worthy of further exploration in a longitudinal study, especially with regard to the role of given substances aggravating the severity of the factors being explored. Third, several associations need further exploration, for example, the role of socioeconomic status, also including other (objective) SES indicators,

or the role of peers with more nuanced scales. Future studies should also add other potential risk and protective factors to obtain a more complex picture of adolescent substance use. In addition, while many adolescents experiment with substances, most of them do not follow up. Comparing these adolescents to chronic users/addicts could sharpen the focus on which of these factors are most predictive and most worthy of use in terms of screening and follow-up.

5. Conclusions

It can be concluded that adolescent substance use is in close connection with many aspects of mental health and well-being. The findings of this study pinpoint several relevant risk factors, including psychosomatic and depressive symptoms or internet addiction, but also several protective factors, namely, future orientation, social support from the family, or life satisfaction. Therefore, a prevention program for reducing adolescent substance use should be complex, drawing attention not only to one specific type of substance use but to several concurrently, as well as to youth mental health. Learning a growth mindset may influence adolescents' attitudes towards substance use and their vulnerability to addictions, and help them with making reasoned actions [60]. A growth mindset may also protect them from negative outcomes by fostering resilience, which should be prioritized in preventive strategies.

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Abbreviations

The following abbreviations are used in this manuscript:

SES	Socioeconomic status
ESPAD	European School Survey Project on Alcohol and Other Drugs
CDI	Children's Depression Inventory
SWLS	Satisfaction With Life Scale
PIUQ-SF	Problematic Internet Use Questionnaire Short-Form
MSPSS	Multidimensional Scale of Perceived Social Support

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