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Prevalence of Substance Use and Its Predictors among Malaysian School-Going Adolescents at Drug-Based Hotspot Areas

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Main Points

- Examining substance use among adolescents not only deepens our understanding of the issue but also directs tangible interventions and influences policies that strive to prevent and tackle substance use in this susceptible demographic.
- The results of this study can be included in the secondary school curriculum to enlighten adolescents about the hazards and repercussions of substance use. This equips them with the knowledge necessary to make well-informed decisions, thus aiding authorities in mitigating the prevalence of substance use among adolescents.
- Additionally, this study recognizes the influence of family dynamics on adolescents' substance use and advocates for the integration of family and community-based therapy to target underlying problems.
- Identification of risk factors could help pinpoint specific factors associated with adolescent substance use, which helps in the development of early prevention programs.
- Policymakers can utilize the research findings to inform law enforcement measures, specifically targeting locations and demographics with elevated rates of substance use among adolescents. This can be achieved through the implementation of focused intervention programs.

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Abstract

The adolescents of a country are its most valuable asset. Substance abuse is preventable in comparison to other significant adolescent health concerns listed by the World Health Organization, such as road traffic accidents, drowning, and violence. Unfortunately, substance abuse can damage adolescents and possibly halt the nation's progress, particularly in places where drugs are easily accessible and cultural norms are shifting. Therefore, we conducted a cross-sectional survey of 3382 Malaysian school-going adolescents aged 13 – 19 to evaluate substance use and its determinants in drug-based hotspot areas. The Alcohol Smoking and Substance Involvement Screening Test measured substance use, while the Youth Self-Report, Self-Problem Test, and Self-Reporting Coping Scale plus Knowledge and Attitudes on Substance Use measured the study's predictors via logistic regression models. Three in ten school-going adolescents are using substance, with adolescents' main substance being tobacco user, whereas polysubstance are tobacco and drugs user. Tobacco has always been the dominant substance for both current and ever users. The risk factor for an individual was male and rule-breaking behavior, followed by the domain of family with the loss of either parent, and finally the community of race and East Malaysian. Adolescents in communities under 10 years with high depression/anxiety, withdrawal, and academic issues reduced substance use by 35%, 8%, 5%, and 2%, respectively. Being a male with a loss of family pillars and a bigger image of Indigenous East-Malaysian adolescents is at risk. Hence, the key solution is a culturally appropriate, gender- and family-based intervention is necessary for masculine adolescents from broken families.
Keywords: Alcohol, drug, drug-infested regions, factors, occurrence, teenager, tobacco

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Introduction

Adolescence connects childhood and adulthood from 10 to 19 years. This period lays the foundation for an individual's health. The remarkable physical, mental, and social development of adolescents influences their mood, reasoning, and decision-making (Jaworska & MacQueen, 2015). Therefore, the World Health Organization (WHO) emphasizes that adolescents are at increased risk for death, sickness, and injury due to poor lifestyle choices, including food, exercise, substance use, and sexual behaviors. Apart from all the major adolescent health hazards on WHO's lists, substance use is preventable when compared to road traffic accidents, drowning, and violence (WHO, 2017).

United Nations Children's Fund (2022a) reports that there are 1.3 billion adolescents worldwide, representing 16% of the global population, but not all have access to formal education. In 2021, only two out of three lower secondary school pupils and one out of two upper secondary school children attended either upper secondary school or further education (United Nations Children's Fund, 2022b). Schools commonly integrate substance use prevention programs into their curriculum or implement them as standalone projects to educate students about the dangers of substance use. These programs educate and provide awareness to adolescents about substance use and the consequences of use in terms of physical and mental health, academic achievement, relationships, and well-being. Usually, these programs include addiction, stress management, coping strategies, healthy lifestyle alternatives, peer pressure, and healthy decision-making (Alarcó-Rosales et al., 2021).

Even with such a prevention program, the incidence was noted to be high, with nearly one in ten adolescents use substance from the year 2016 to 2018, with males at risk (World Health Organization, 2023). Previous research has found a prevalence range of 19.4 – 47% among school-going adolescents (Mavura et al., 2022; Mokwena & Setshego, 2021; Umukoro et al., 2021), which proves that substance use among school-going adolescents is a global problem. However, those studies do not focus on the drug hotspot area, which may influence substance use.

When there is a high concentration of drug-related activities like trafficking, drug use, and crimes that region is said to be a drug hotspot area (Lessler et al., 2017). These communities are characterized by drug traffickers, unrestricted drug markets, and increased substance use. The incidence of substance use in drug hotspot areas has been steadily rising because these areas often have a confluence of risk factors for substance use, including social milieu, stress, availability, lack of resources, and peer pressure, making the population more susceptible to risky behavior, especially adolescents who are still developing.

Risk factors for substance use vary by country, but they typically fall into one of three categories: individual, family, or community. The predictors for individuals are pocket money, academic achievement (Rakić et al., 2014), sport, behavioral issues, and mental health (Umukoro et al., 2021), followed by familial or parental status (Mokwena & Setshego, 2021), and lastly, community factors of peer pressure and media (Mavura et al., 2022). Unfortunately, none of these studies focus on school-going adolescents in drug hotspot areas.

Substance use is a worldwide problem. Malaysia has 4.8 million adolescents, representing 14.7% of its 32 million inhabitants (DOSM, 2019), of whom 80% regardless of gender are having access to education (United Nations Children's Fund, 2021). Studies conducted in Malaysia focus more on individual substance use (Hong & Peltzer, 2019; Jane Ling et al., 2022; Pei Pei et al., 2021) than on substance use as a whole. However, only two studies evaluated substance use as a whole: one reported on a type of substance-user of 17.2% monosubstance and 5.1% polysubstance use (Ismail et al., 2022), plus a status of substance-user of 5.5% ever and 3.5% current users (Rodzlan Hasani et al., 2021). There is a limitation in both studies where the Ismail et al. (2022) study population were youth aged 15 – 40 years old, and Rodzlan Hasani et al. (2021) studied adolescents aged 13 – 17 years old, which is not inclusive of the adolescent age range of 10 – 19 years old specifically.

Further scoped, only one study has confirmed the significance of individual, family, and community factors in substance use (Rodzlan Hasani et al., 2021). Each of these elements has been broken down into its component parts: the individual (boys between the ages of 13 and 15 with discipline problems and mental health issues), the family (issues of parent connection, bonding, and ethnicity), and the community (peer pressure and bullying in adolescents), but the drug hotspot area has not been the focus of this research.

National Anti-Drug Agency (NADA) of Malaysia has coined the term "Hotspot Areas," which refers to geographical regions where a greater-than-average amount of social problems have been observed, such as social diversion and drug addiction-related criminality. In 2020, NADA re-demarcated the entire country, identifying 155 hotspot regions with the aim of reducing substance use by 2025 (NADA, 2023).

Substance use is linked to dependence and other issues, and younger people are more affected by it than older people (Ismail et al., 2022). Adolescents are the nation's future; therefore, investing in them is essential for its progress. This is often preventable or treatable. Consequently, this research aims to identify the actual scope of the issue and focus on areas that require intervention before it becomes the norm throughout the nation. Hence, the study's goal is to determine the prevalence and predictors of substance use among school-going adolescents in a drug-based hotspot area in Malaysia.

Material and Methods

Study Design, Area, and Population

This study was a secondary data analysis from the Study of Social Issues of Youths in Malaysia, which was collected in 2020 – 2023. We conducted a cross-sectional survey among Malaysian school-going adolescents aged 13 – 19. This study is representative of the entire Malaysian population, encompassing both the eastern and western regions. A total of eight states: Kedah, Penang, Kelantan, Terengganu, Selangor, Johor, Sabah, and Sarawak were surveyed in this study. We used the drug hotspot area demarcation from NADA to determine the district in each state (NADA, 2023), as illustrated in Figure 1.

Data Collection

Self-administered questionnaires were employed. Based on the sample inclusion and exclusion criteria in Figure 2, the

researcher sought potential participants. All researchers and enumerators were properly trained and adhered to the government's coronavirus disease 2019 (COVID-19) standard operating procedures for data collection in academic institutions. The adolescent was guided through the questionnaire by the teacher during the lockdown in response to the COVID-19 pandemic.

Figure 2 illustrates the use of multistage stratified cluster sampling to ensure sample representativeness. A single proportion method was used to determine prevalence, adjusting for target population size, design effect, and 30% non-response. According to Mokwena and Setshego (2021), the minimum sample size for 47% prevalence was 1096 respondents. A total of 3382 adolescents from 77 chosen schools in eight Malaysian states and drug-based hotspot areas voluntarily answered the questionnaire with written informed consent from their parents or legal guardians.

Study Tool

The questionnaire has several sections, namely Section A: Sociodemographic, Section B: Youth Self-Report (YSR), Section C: Self-Problem Test, Section D: Self-Reporting Coping Scale (SRCS), Section E: Knowledge and Attitudes on Substance Use, Section F: Drug-use Information, and Section G: Alcohol, Smoking, and Substance Involvement Screening Test (ASSIST). However, because the focus of this study was on overall substance use rather than drugs, we did not include Section F in the data analysis. This assessment of adolescent substance use was developed by utilizing only a subset of the original questionnaire, which was translated into a Malay version. The objective was to ensure that the assessment could be completed in 30 minutes in order to optimize the students' study time and prevent the adolescents from becoming fatigued. Section A has 13 questions concerning age, gender, ethnicity, race, living and school environment, parents' relationship, occupation, and income. In Malaysia, there are three dominant races: Malay, Chinese, Indian, and others. The others are from East Malaysia, specifically Sarawakian and Sabahan. The income groups in Malaysia are categorized as T20, M40, and B40. B40 refers to the lowest 40% of individuals in terms of income, M40 represents the middle 40%, and T20 represents the highest 20%.

Youth Self-Report has 53 items that cover two domains: internal and external, and four subdomains: withdrawn, anxious/depressed, aggressive, and rule-breaking. The YSR has been translated into Malay by Nik Jaafar et al. (2013), and the Cronbach α values for the three domains (internalizing, externalizing, and social issues) range from 0.85 to 0.90. Higher scores indicate adolescent emotional problems.

Section C contains the Mooney Problem Checklist 1950 Revisions of self-problem questions. This survey has 60 questions examining financial, self-esteem, family, spiritual, educational, and employment goals. This study employs a validated and translated Malay version of the questionnaire, originally developed by Rozmi et al. (2017) with a Cronbach α value of 0.904. Adolescents with higher scores signify greater problems faced by the adolescent in the respective aspect.

Problem-solving is one of the five-scale ideas in the SRCS to measure adolescent coping techniques. This study solely examines academic and peer coping skills using problem-solving coping methods among adolescents with eight items in each domain. According to Quynh and Hua (2021), a higher score on the questionnaire suggests a greater tendency to use substances as a coping mechanism. Additionally, Hamsan (2009) reported a Cronbach's α value of 0.78 for this questionnaire.

Ireland's drug knowledge, attitudes, and beliefs were measured by Audrey Bryan's KAB exam. We used the Malay-translated version of Al-Zurfi et al. (2016) for this survey, which consists of 35 items that solely examine knowledge and attitude on substance use. Higher ratings indicate better knowledge and attitudes about consequences, prevalence, treatment, prevention, policy, and community substance use. The Cronbach alpha coefficients for the knowledge and attitude surveys were 0.687 and 0.681, respectively (Nasir et al., 2016).

The outcome of this study was examined using the ASSIST version 3.0 questionnaire. The objective of ASSIST is to promptly and precisely detect substance use problems during the past 3 months (WHO, 2010). The dependent variable of this study is substance use, which means that any "yes" to either one or more substances of drug, tobacco, or alcohol is considered substance use regardless

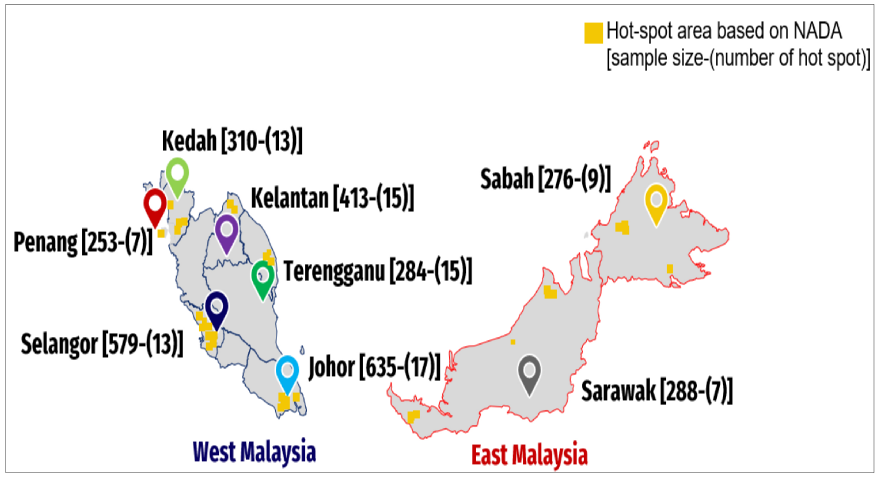

Figure 1. Number of Samples Taken According to the Selected State in Malaysia (n = 3038).

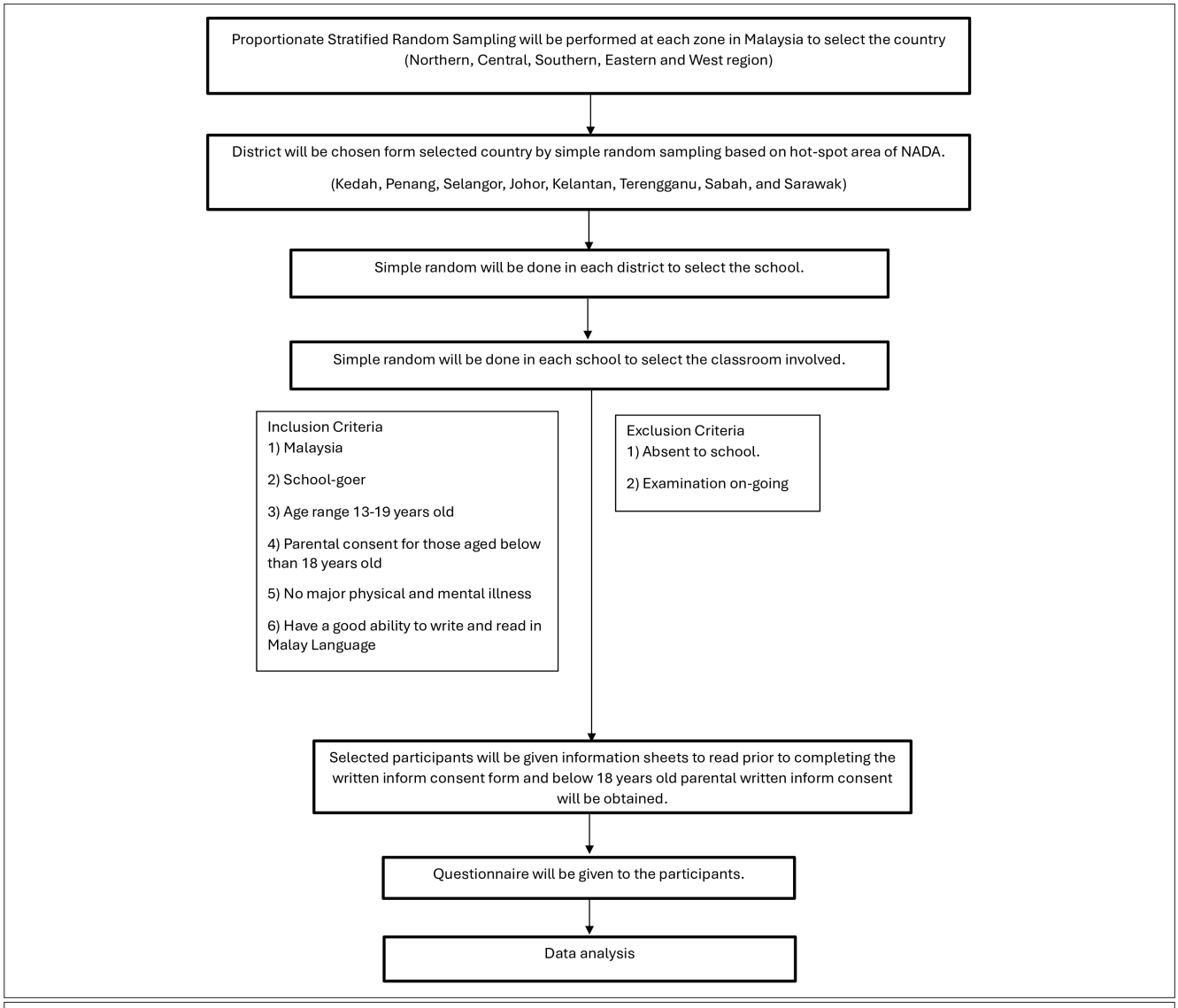

Figure 2. Data Collection.

of the duration consumed, while a non-user is a respondent who has never consumed any substance in their lifetime. We classified respondents who replied "yes" for substance use and last use in the past 3 months as current users, while those who replied "no" for last use in the past 3 months were considered ever users. Polysubstance users are those who tested for more than one substance, while monosubstance users are those who checked for only one.

A pilot study was conducted with 50 respondents from Selangor, which was separate from this study participants, and reliability analysis showed satisfactory reliability, with a Cronbach's α for YSR = 0.934, Self-Problem Test = 0.891, SRCS = 0.902, and knowledge and attitude = 0.884.

Data Processing and Analysis

Data were analyzed using SPSS software version 27 (IBM SPSS Corp.; Armonk, NY, USA). We extracted data on substance use and selected variables from the raw data, presenting them as frequencies and proportions for categorical variables, and as mean and standard deviation for continuous variables. We analyzed the associated predictors for substance use using simple logistic regression (SLR) and multiple logistic regression (MLR) analyses.

Ethical Approval This study was approved by the Ethics Committee of the Secretariat of Research Ethics, Universiti Kebangsaan Malaysia, Faculty of Medicine, Cheras, Kuala Lumpur, Malaysia on 23rd March 2020 (Reference no: UKM PPI/111/8/JEP-2020-174(2)). Approval from the Education Planning and Research Division, Ministry of Education Malaysia, state, and district education offices was obtained before data collection.

Results

Participant Socio-Demographic Characteristics

As shown in Table 1, the total number of respondents was 3382, and most of the participants were from West Malaysia (73.2%). There is an equal proportion of urban (51.7%) and rural (48.3%) participants, as well as mothers of adolescents who are working (50.3%) and unemployed (49.7%). In the meantime, more than half of the respondents are male (71.7%), Malay (74.5%), live on landed property (81.4%), have lived in a community for more

than or equal to 10 years (69.6%), have attended school (94.0%), have no history of disciplinary offenses (95.3%), are parents who live together (80.1%), are employed fathers (87.9%), and have a family income of B40 (86.0%).

Adolescent Social and Behavioral Characteristics

According to YSR, 56.4% of adolescents have internal issues with a mean score of 12.3 (6.86), and the subdomain of anxious/depressed scores has the highest mean of 7.1 (4.64). In the Self-Problem Test, the average score for the job goal is 36.0 (7.55), with the financial goal coming in second at 34.7 (5.54) and the religious/morality goal at 34.0 (7.29). Next, the SRCS reveals that most adolescents have a better coping skill in dealing with peers 28.4 (7.40) compared to academics. Similarly, when it comes to knowledge and attitude on substance use, adolescents have the highest mean score of 90.3 (22.31), surpassing the knowledge of school-going adolescents, as Table 2 illustrates.

Table 1.
Sociodemographic Characteristics of School-Going Adolescents in Malaysia (n = 3382)

Variable	*n* (%)
State	
West Malaysia	2474 (73.2)
East Malaysia	908 (26.8)
Locality	
Rural	1747 (51.7)
Urban	1635 (48.3)
Age (years)	
Mean (SD)	15.4 (2.28)
Gender	
Male	2425 (71.7)
Female	957 (28.3)
Race	
Malay	2519 (74.5)
Chinese	261 (7.7)
Indian	176 (5.2)
Others*	426 (12.6)
Type of house	
Landed property	2752 (81.4)
Shared property	630 (18.6)
Years living in that community	
<10 years	1027 (30.4)
≥10 years	2355 (69.6)
Like school	
Yes	3180 (94.0)
No	202 (6.0)
Change school due to disciplinary offences	
Yes	159 (4.7)
No	3223 (95.3)
Parental relationship status	
Living together	2709 (80.1)
Divorce	324 (9.6)
Not living together	93 (2.7)
One of them has died	256 (7.6)
Father's job	
Employed	2974 (87.9)
Unemployed	408 (12.1)
Mother's job	
Employed	1702 (50.3)
Unemployed	1680 (49.7)
Income classification	
B40	2909 (86.0)
M40	384 (11.4)
T20	89 (2.6)

Note: *Sarawakian (Kadazan-dusun) (Kadazan-Dusun) and Sabahan (Iban).

Self-Report Prevalence of Substance Use

The prevalence of substance use among school-going adolescents is 33% overall prevalence of ever and current prevalence of substance use was 12% and 21%, respectively. While the monosubstance and polysubstance use of current users are 16% and 5%, respectively, as shown in Figure 3.

Status of substance users is shown in Table 3. Among those who reported currently using substances, the most commonly reported were tobacco (19.0%) and alcohol (3.4%), followed by Kratom (2.0%), hallucinogens (1.2%), and amphetamine (0.6%). While for ever using substances were tobacco (28.5%) and alcohol (8.0%), followed by Kratom (5.8%), hallucinogens (3.3%), and cannabis (1.9%).

Type of substance use is explained in Figure 4. The prevalence of polysubstance use is as follows: tobacco and drug 2.9%, followed by tobacco and alcohol 2.1%, alcohol and drug 0.7%, and finally tobacco, alcohol, and drug 0.6%. Meanwhile, for monosubstance use, the prevalence is as follows: tobacco 19.0%, drug 3.9%, and alcohol 3.4%.

Analysis for Factors Associated with Substance Use

The binary logistic regression model in Table 4 showed that being a male has a six-time risk (OR = 6.62) for the adolescent to be a

Table 2.
Social and Behavioral Characteristics of School-Going Adolescent in Malaysia (n = 3382)

Variable	Mean (SD)
Youth Self-Report	
Internal	12.3 (6.86)
Withdrawn	5.2 (2.96)
Anxious/depressed	7.1 (4.64)
External	11.8 (8.31)
Rule-breaking behavior	4.7 (3.66)
Aggressive	7.2 (5.40)
Self-Problem Test	
Financial	34.7 (5.54)
Self-esteem	33.2 (6.45)
Family	28.4 (4.94)
Religious/morality	34.0 (7.29)
Job goal	36.0 (7.55)
Academic	33.0 (7.39)
Self-Reporting Coping Scale	
Coping skills related to academic problems	27.7 (7.01)
Coping skills related to peer problem	28.4 (7.40)
Knowledge on substance use	63.7 (15.06)
Attitudes on substance use	90.3 (22.31)

Note: SD = Standard deviation.

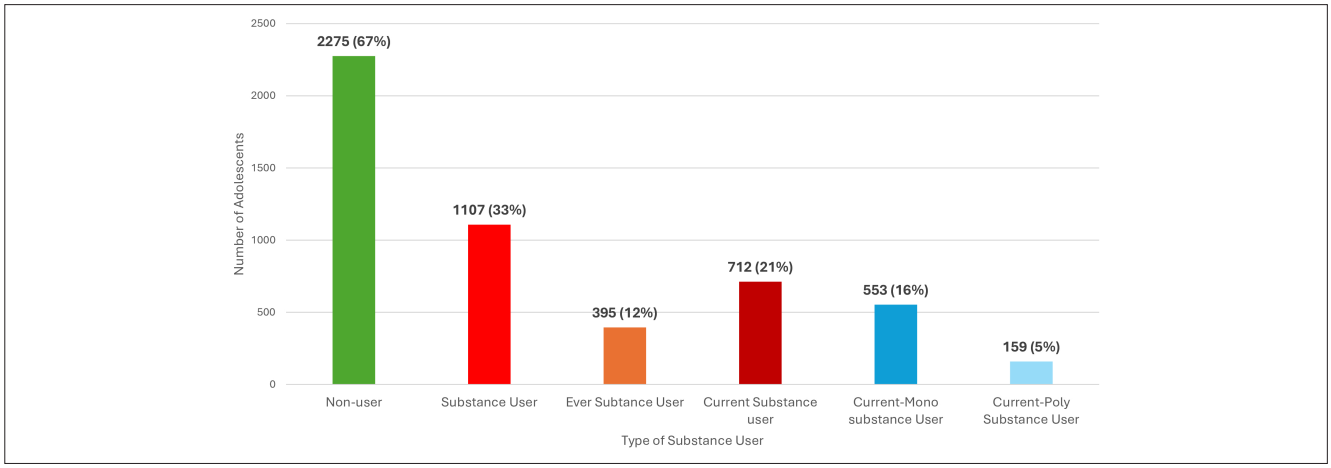

Figure 3. Self-Reported Prevalence of Substance Uses Among School-Going Adolescents in Malaysia (n = 3382).

substance user. Adolescents with rule-breaking behavior, other race such as Sarawakian and Sabahan, the loss of either parent, and from East Malaysia have odds of 1.23, 1.39, 1.67, and 1.92 respectively, to be substance users.

The adolescents' social and behavioral traits were evaluated with the help of four validated questionnaires; however, only the YSR (<0.001 and 0.002) and the Self-Problem Test (0.032) were found to be statistically significant.

However, there are more protective factors noted, which are adolescents living in community for less than 10 years, withdrawal, depression/anxiety, and academic problems. Interestingly, adolescents living in a community less than 10 years were noted to reduce the risk of substance use by 35%, while withdrawn by 8%, depression/anxiety reduced it by 4% and academic problems reduced it by 2%.

The interaction between variable gender with academic problems was noted to be significant (0.011). Female adolescents with high academic mean scores have reduced the risk by 6%. Meanwhile, males with higher mean scores for academic problems have increased the risk of substance use by 6% among adolescents.

The Pseudo R2 value obtained in this study was 0.292, indicating that the variable under investigation accounts for only 29.2% of the total factors associated with substance use.

Discussion

Adolescent substance use is a global issue. Understanding adolescent substance use patterns is necessary to design effective prevention, intervention, and harm reduction strategies. This study found that 33% are substance users, which the prevalence is higher than earlier research, ranged from 19.4% to 22.3% (Rodzlan Hasani et al., 2021; Umukoro et al., 2021). Identifying a pattern is challenging because those studies are not drug-based hotspot areas like this one. Substance availability in drug hotspot areas and adolescents' vulnerability (Heyes & Hiu, 2016) may explain the epidemic's expansion. Furthermore, a recent review has reinforced this statement, suggesting that

Table 3.
Self-Reported Prevalence of Substance Use Among School-Going Adolescents in Malaysia (n =3382)

Variable	Status of Substance User			
Type of Substance	Current* *n* (%)	CI (Minimum/Maximum)	Ever** *n* (%)	CI (Minimum/Maximum)
Tobacco[1]	643 (19.0)	17.7/20.4	964 (28.5)	27.0/30.1
Alcohol[2]	116 (3.4)	2.9/4.1	272 (8.0)	7.1/9.0
Drug				
Cannabis[3]	18 (0.5)	0.3/0.8	63 (1.9)	1.4/2.4
Cocaine[4]	16 (0.5)	0.3/0.8	28 (0.8)	0.6/1.2
Amphetamine[5]	19 (0.6)	0.3/0.9	29 (0.9)	0.6/1.2
Inhalant[6]	14 (0.4)	0.2/0.7	22 (0.7)	0.4/1.0
Sedative[7]	16 (0.5)	0.3/0.8	32 (0.9)	0.6/1.3
Hallucinogen[8]	41 (1.2)	0.9/1.6	113 (3.3)	2.8/4.0
Opioid[9]	9 (0.3)	0.1/0.5	20 (0.6)	0.4/0.9
Kratom[10]	68 (2.0)	1.6/2.5	195 (5.8)	5.0/6.6

Note: *Current substance use is who answered "Yes" within 3 months preceding the survey. **Ever substance use is who answered "Yes" for lifetime use and current use within 3 months preceding the survey.
[1]Cigarette, Chewing Tobacco, Cigars, etc. [2]Beers, Wine, Liquor, etc. [3]Cannabis, Pot, Grass, Hash, etc. [4]Coke, Crack, etc. [5]Speed, Meth, Ecstasy, etc. [6]Nitrous, Glue, Gasoline, Paint Thinner, etc. [7]Diazepam, Alprazolam, Midazolam and Others. [8]LSD, Acid, Mushrooms, Thrips, Ketamine, etc. [9]Heroin, Morphine, Methadone, Buprenorphine, Codeine, and Others. [10]Kratom.

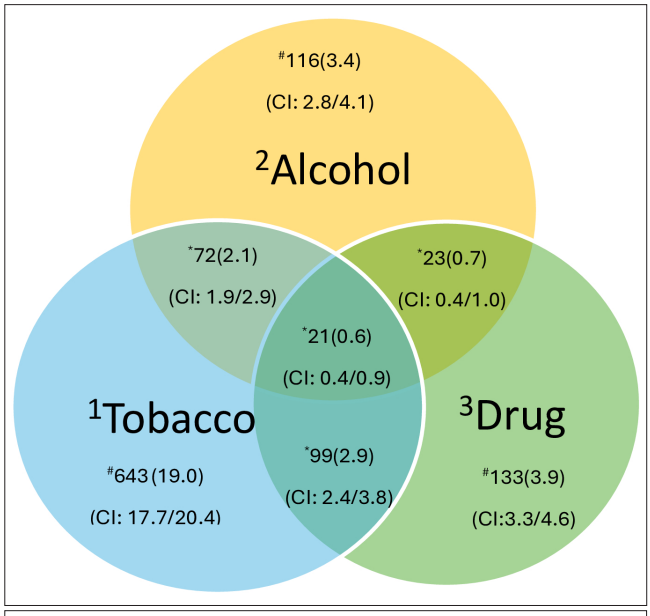

Figure 4. Self-Reported Prevalence of Types of Substance Uses Among School-Going Adolescents in Malaysia (n = 1107), n (%).

more drug hotspot areas tend to attract a higher number of users (Ndayongeje et al., 2018).

One study in South Africa, based on data collected in rural areas, reveals a higher prevalence of 47% (Mokwena & Setshego, 2021), despite the fact that many others show a far lower incidence. South Africa is a lower-middle-income country (ESARO, 2023) according to GDP, which means that the government may have fewer resources available to cope with addiction prevention initiatives and medical care that is still subpar (Maphumulo & Bhengu, 2019). Health care facilities in Malaysia are better suited to the needs of adolescents (Ministry of Health, 2009) than those in South Africa, which focus more on serving the overall community than on providing services to any one demographic in particular. A lack of interventions and effective prevention may contribute to the high rates of substance use in South Africa.

In terms of substance status, both current and ever-users use tobacco the most, which is similar to a previous study in Malaysia (Ismail et al., 2022). On the other hand, the most common monosubstance use among adolescents is tobacco, which is similar to the Malaysian study (Rodzlan Hasani et al., 2021), but in countries like Serbia (Rakić Dušica et al., 2014), Tanzania (Mavura et al., 2022), and South Africa (Mokwena & Setshego, 2021), alcohol is the most common. Adolescent substance use differs by nation due to cultures that promotes it. Most Western societies, like Africa have long accepted alcohol consumption as an integral part of adulthood, social events, and celebrations (Birhanu et al., 2014). In Malaysia, parents' attitudes and actions play a significant role in encouraging young people to try tobacco for the first time, in addition to cultural influences (Nawi et al., 2021).

Adolescents engage in polysubstance use, consuming both tobacco and drugs. Although the results of this study differ from a previous Malaysian study (Rodzlan Hasani et al., 2021) on tobacco and alcohol, they are consistent with data collected in drug-based hotspot areas, where drug availability and use are significantly higher than in the general population. Smoking and drug use are socially accepted habits taught by parents and older siblings in the hotspot area, plus the thrill of experimenting with new things among adolescents, making them common among all users (Mavura et al., 2022).

Individual, familial, and community elements influenced substance use among adolescents (Nawi et al., 2021). The current study found that individual factors of adolescence are gender, withdrawal, depression/anxiety, rule-breaking behavior, and academic problems, while for family are parental status and community, which consist of race, years spent in the community, and state. These are the significant features that influence substance intake among school-going adolescents in Malaysia.

Individual gender factors increased by six for adolescent boys, consistent with previous studies (Mokwena & Setshego, 2021; Rodzlan Hasani et al., 2021). Sensation-seeking conduct is more prevalent among males, who actively seek out fresh and thrilling experiences (Nawi et al., 2021). The high they get from using substances may entice adolescent boys to experiment with them more than girls. Except for one study from Tanzania, females are at a higher risk of substance use because the sample size is more female than male (Mavura et al., 2022).

Next, rule-breakers were more likely to use substances, according to recent research (Mokwena & Setshego, 2021). Adolescents who transgress the rules may have an increased need for novelty and excitement (Nawi et al., 2021). The theory of personality, which views substance use as a type of individualism or nonconformity that allows users to express their unique identities and challenge societal norms, also supports the idea that adolescents who transgress the rules may have an increased need for novelty and excitement (Lee & Yeager, 2020).

The individual domains such as high scores in withdrawal, depression/anxiety, and academic issues protect school-going adolescents from substance use. On the other hand, adolescents who exhibit withdrawn behavior may tend to pursue solo activities or maintain a close-knit group of friends. They have developed strong coping mechanisms and emotional regulation abilities to manage stressful situations and negative emotions without resorting to substance use (Nawi et al., 2021).

Adolescents with high depression/anxiety scores and academic problems serve as buffers against substance use, which challenges the results from the previous study (Umukoro et al., 2021). Malaysia has implemented adolescent-friendly healthcare services (UNICEF, 2022c), recognizing the specific needs and concerns of adolescents with mental health and substance use issues (Ministry of Health, 2014). The school health team is required to conduct adolescent health status screenings, through which adolescents with problems receive appropriate treatment and intervention for their challenges (Ministry of Health, 2009). Effective treatment can address the underlying issues and provide healthier coping mechanisms, reducing the need for substance use.

This study's interaction analysis shows that girls with higher academic scores have a lower chance of substance use, but unfortunately, boys with underlying academic problems have an increased risk of being substance users. Most prior research has

Table 4.
Analysis for Factors Associated with Current Substance Use (n = 3382)

			SLR		MLR	
Variable	**Yes *N* (%)**	**No *N* (%)**	**Crude OR (95% CI)**	***p***	**Adjusted OR* (95% CI)**	***p***
State[c]					–	
West Malaysia	411 (16.6)	2063 (83.4)	1			–
East Malaysia	301 (33.2)	607 (66.8)	2.49 (2.091, 2.962)	<.001	1.921 (1.525, 2.421)	<.001
Locality[c]						
Rural	416 (23.8)	1331 (76.2)	1	<.001	–	–
Urban	296 (18.1)	1339 (81.9)	1.41 (1.196, 1.671)		–	–
Age (years) mean (SD)[a]	15.65 (1.81)	15.26 (2.388)	1.19 (1.101, 1.282)	<.001	–	–
Gender[a]						
Female	33 (3.5)	924 (96.5)	1		–	–
Male	679 (28.0)	1746 (72.0)	10.89 (7.609, 15.582)	<.001	6.621 (4.566, 9.601)	<.001
Race[c]						
Malay	479 (19.0)	2040 (81.0)	1			
Chinese	48 (18.4)	213 (81.6)	0.834 (0.603, 1.154)	.273	–	–
Indian	34 (19.3)	142 (80.7)	0.893 (0.608, 1.310)	.562	–	–
Others	151 (35.5)	275 (64.5)	2.344 (1.884, 2.917)	<.001	1.378 (1.029, 1.847)	.032
Type of house[b]						
Shared property	125 (19.8)	505 (80.2)	1		–	–
Landed property	587 (21.3)	2165 (78.7)	0.91 (0.736, 1.133)	.408	–	–
Years living in that community[c]						
More than or equal to 10 years	545 (23.1)	1810 (76.9)	1		–	–
Less than 10 years	167 (16.3)	860 (83.7)	0.645 (0.533, 0.781)	<.001	0.649 (0.524, 0.803)	<.001
Like school[a]						
Yes	661 (20.79)	2519 (79.21)	1			
No	51 (25.25)	151 (74.75)	1.29 (0.926, 1.788)	.132	–	–
Change school due to disciplinary offences[a]						
Yes	49 (30.8)	110 (69.2)	1			
No	663 (20.6)	2560 (79.4)	0.58 (0.411, 0.823)	.002	–	–
Parental relationship status[b]						
Living together	535 (19.8)	2174 (80.2)	1		–	–
Divorce	82 (25.3)	242 (74.7)	1.38 (1.054, 1.800)	.019	–	–
Not living together	23 (24.7)	70 (75.3)	1.36 (0.826, 2.159)	.238	–	–
One of them has died	72 (28.1)	184 (71.9)	1.59 (1.192, 2.122)	.002	1.668 (1.206, 2.306)	0.002
Father's job[b]						
Unemployed	142 (21.1)	531 (78.9)	1		–	–
Employed	570 (21.0)	2139 (79.0)	0.10 (0.810, 1.226)	.973	–	–
Mother's job[b]						
Unemployed	358 (20.23)	1412 (79.99)	1		–	–
Employed	354 (21.96)	1258 (78.04)	1.11 (0.941, 1.309)	.217	–	–
Income classification[b]						
T20	20 (22.5)	69 (75.5)	1			
M40	70 (18.2)	314 (81.8)	0.82(0.622, 1.075)	.324	–	–
B40	622 (21.4)	2287 (78.6)	1.16(0.905, 1.480)	.390	–	–
Youth Self-Report						
Internal	11.424 (6.426)	12.503 (6.956)	0.976 (0.964, 0.989)	<.001		
Withdrawn[a]	4.736 (2.819)	5.259 (2.988)	0.94 (0.914, 0.968)	<.001	0.918 (0.882, 0.956)	<.001
Depression/anxious[a]	6.688 (4.361)	7.244 (4.711)	0.97 (0.956, 0.992)	<.005	0.956 (0.929, 0.984)	.002
External	15.666 (9.358)	10.815 (7.689)	1.067 (1.057, 1.078)	<.001	–	–
Aggressive[a]	8.826 (5.852)	6.728 (5.184)	1.21 (1.181, 1.236)	<.001	–	–
Rule-breaking behavior[a]	6.840 (4.245)	4.087 (3.255)	1.07 (1.054, 1.086)	<.001	1.234 (1.200, 1.269)	<.001

(*Continued*)

Table 4.
Analysis for Factors Associated with Current Substance Use (n = 3382) (Continued)

			SLR		MLR	
Variable	**Yes *N* (%)**	**No *N* (%)**	**Crude OR (95% CI)**	***p***	**Adjusted OR* (95% CI)**	***p***
Self-Problem Test						
Financial[b]	34.813 (5.380)	34.616 (5.588)	1.01 (0.991, 1.022)	.398	–	–
Self-esteem[a]	32.597 (6.547)	33.362 (6.411)	0.98 (0.970, 0.995)	.005	–	–
Family[b]	28.368 (5.087)	28.464 (4.897)	1.00 (0.980, 1.013)	.644	–	–
Religious/morality[c]	33.195 (7.568)	34.182 (7.201)	0.98 (0.971, 0.993)	<.001	–	–
Job goal[a]	35.517 (7.777)	36.103 (7.485)	0.99 (0.979, 1.001)	.007	–	–
Academic[a]	31.740 (7.637)	33.356 (7.285)	0.97 (0.961, 0.982)	<.001	0.987 (0.974, 0.999)	.032
Self-Reporting Coping Scale (SRCS)	26.805 (7.163)	27.882 (6.954)	0.98 (0.968, 0.990)	<.001	–	–
Coping skills related to academic problems[a]	27.579 (7.311)	28.638 (7.405)	0.98 (0.971, 0.992)	<.001	–	–
Coping skills related to peer problems[a]						
Knowledge on materials use[a]	64.260 (15.474)	63.538 (14.949)	1.00 (0.998, 1.009)	.256	–	–
Attitudes on materials use[a]	90.142 (22.428)	90.336 (22.283)	1.00 (0.996, 1.003)	.836	–	–
Interaction						
Gender* Academic[#]					0.986 (0.975, 0.997)	.011
Male* Academic					1.060 (1.048, 1.072)	<.001
Female* Academic					0.944 (0.933, 0.955)	<.001

Note: Hosmer-Lemeshow test ($p = .0613$), the model of this study was noted to be fit and classified as a good model with a score of 85.48% plus no outlier noted. MLR = Multiple logistic regression; OR = Odds ratio; SLR = Simple logistic regression.
*Forward LR Multiple Logistic Regression Model was applied. Multicollinearity was checked and not found. [#]Component from Self-Problem Test. Significant *p*-value < .05. [a]Individual domain. [b]Family domain.
[c]Community domain.

overlooked the potential for an interaction between variables. However, the theory of motivation offers a compelling explanation for why female adolescents struggling with academic issues exhibit high levels of intrinsic motivation to improve (Asaba et al., 2022). In addition, because of the nature of the underlying problem, these adolescent girls will always have the undivided attention of parents and teachers (Mavura et al., 2022). With support from both parents and teachers, they will be able to ignore the pressure to start using substances and instead concentrate on improving their academic success.

In Malaysia, when it comes to male adolescents, there are many societies with traditional gender norms that encourage males to be self-reliant, stoic, and emotionally restrained (Nawi et al., 2021). Perceiving help as a sign of weakness or vulnerability can discourage males from seeking assistance (Rodzlan Hasani et al., 2021). Therefore, when young males struggle academically, they may turn to substances as coping mechanisms, as they can temporarily provide a sense of confidence or relief.

The second domain centers on family dynamics, which significantly impact the development of adolescents. A Malaysian study (Rodzlan Hasani et al., 2021) strengthens the finding that the loss of either parent aggravates substance use among school-going adolescents. The death of parents threatens adolescents' emotional support, direction, and sense of security. Adolescents who experience feelings of uncertainty or instability because of this disruption may seek solace in substance use (Mavura et al., 2022). Insufficient parental supervision can provide adolescents with more opportunities and freedom to engage in substance use without immediate consequences or detection.

The community, which surrounds adolescents, is the final domain. Indigenous people from East Malaysia, specifically Sabah and Sarawak (the "other Bumiputeras" group), had the greatest prevalence of substance use in this research. Adolescent substance use may have had complex causes, including cultural and traditional factors. It is common practice for the "other Bumiputera" category, which includes indigenous people from Sabah and Sarawak, to drink alcohol during celebrations and social events (Rodzlan Hasani et al., 2021). While in West Malaysia, it is illegal to sell alcohol to Muslims, and the country strictly prohibits alcohol consumption for all Muslims. This result explains the high prevalence of tobacco uses than alcohol and drug use as monosubstance and tobacco and drug as polysubstance use in Malaysia among the school-going adolescent at the drug hotspot area.

Furthermore, studies rarely examine the lower likelihood of substance use among adolescents who have lived in communities for less than 10 years. The role of community in the socio-ecological model is very important in shaping adolescents (Duh-Leong et al., 2021). Adolescents who have only recently moved to a neighborhood may not have had much of an opportunity to interact with drug-using friends and acquaintances. Shorter residency terms may reduce the likelihood of a person making connections with others who share a history of substance use.

Interestingly, previous studies did not explore the fact that adolescents from East Malaysia are more likely to be substance users.

East Malaysia is a low-income state, with the poorest districts, nine out of ten, located within it (Economy, 2021). Hence, East Malaysia is generally at a disadvantage because of the lack of accessible recreational opportunities, community hubs, and structured programs (Nawi et al., 2021). Due to a smaller population and fewer resources dedicated to prevention, substance use may be more prevalent in these locations (Mokwena & Setshego, 2021). Adolescent substance use is more likely to be pervasive in more isolated places, where it also has a greater chance of becoming institutionalized as part of the cultural fabric (Nawi et al., 2021).

This is one of the first local studies to evaluate substance use in a high-risk community although the cross-sectional design limits the causality of the factors revealed in this study toward substance use. Previous studies did not focus on substance use in high-risk communities like drug hotspot areas. Furthermore, the data collection took place during the coronvavirus disease 2019 (COVID-19) pandemic, which restricted the researchers' mobility by prohibiting outsiders from entering school premises. Thankfully, we collaborated with teachers to conduct the research under their guidance, asking students to respond to the questionnaire. Additionally, the government implemented a nationwide lockdown due to the pandemic, which delayed data collection.

This study concludes that there is a higher prevalence of substance use among school-going adolescents in drug-based hotspot areas, and the predictors involve individual, familial, and community domains. Therefore, to minimize substance use among school-going adolescents, intervention programs, substance policies, and professional support must be improved or created. A culturally sensitive, gender- and family-based intervention is key to solving the problems faced by male adolescents from broken families. Those adolescents need education and awareness programs. Educational institutions, medical professionals, and community groups can educate adolescents about substance use and better stress management techniques. Adolescents who receive this training are better equipped to evaluate their activities and make wise choices. Finally, future cohort studies should include those with disabilities, undocumented or stateless adolescents, and those with legal difficulties.

Ethics Committee Approval: This study was approved by the Ethics Committee of the Secretariat of Research Ethics, Universiti Kebangsaan Malaysia, Faculty of Medicine, Cheras, Kuala Lumpur, Malaysia (Date: 23 March 2020 Reference no: UKM PPI/111/8/JEP-2020-174(2)). Approval from the Education Planning and Research Division, Ministry of Education Malaysia, state, and district education offices was obtained before data collection.

Informed Consent: Written informed consent was obtained from the students and/or parents who agreed to take part in the study.

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Genişletilmiş Özet

Uyuşturucunun Yoğun Olduğu Bölgelerde Okula Giden Malezyalı Ergenler Arasında Madde Kullanımının Yaygınlığı ve Belirleyicileri

Arka plan: Dünya genelinde ergenler arasında madde kullanımı artmaktadır. Özellikle uyuşturucunun yoğun olduğu bölgelerde madde kullanımı ergenlere zarar vererek ülkenin gelecekteki büyümesini sekteye uğratabilir. Bunun yanı sıra, ergenler arasında madde kullanımı akademik zorluklara, ruh sağlığı da dahil olmak üzere sağlıkla ilgili sorunlara, zayıf aile ve akran ilişkilerine ve çocuk adalet sistemine dahil olmaya yol açabilir. Uyuşturucunun yoğun olduğu bölgeler madde kullanımını etkileyebilir, ancak özellikle bu yönleri ele alan araştırma sayısı azdır. Bu nedenle, bu çalışma Malezyalı okula giden ergenler arasında madde kullanımının yaygınlığını ve bunun belirleyicilerini inceleyecektir.

Yöntemler: Bu çalışma, 13-19 yaşları arasındaki Malezyalı okula giden ergenlere yönelik kesitsel bir anket olan Malezya'daki Gençlerin Sosyal Sorunları Çalışması 2022'nin ikincil veri analizidir. Madde kullanımını ölçmek için Alkol Sigara ve Madde Bağımlılığı Tarama Testi (ASSIST) kullanılırken, çalışmanın belirleyicilerini ikili lojistik regresyon modelleri aracılığıyla değerlendirmek için Gençlik Öz Raporu, Öz Problem Testi, Öz Raporlama Başa Çıkma Ölçeği ve Madde Kullanımına İlişkin Bilgi ve Tutumlar kullanılmıştır. Selangor'dan 50 kişiyle yapılan pilot çalışmada YSR için Cronbach alfa değerleri 0.934, kendi kendine problem testi 0.891, SRCS 0.902 ve bilgi ve tutum testi 0.884 olarak bulunmuştur. Veri analizi için SPSS, sürüm 27 istatistik paketi kullanılmıştır. Veri toplamadan önce bu çalışma için üniversiteden etik onay, Malezya Eğitim Bakanlığı Eğitim Planlama ve Araştırma Bölümü ile eyalet ve ilçe eğitim müdürlüklerinden onay alınmıştır. Araştırmaya 18 yaş ve üzeri öğrenciler yazılı onay vererek katılırken, 18 yaş altı öğrenciler için ebeveyn onayı gerekmiştir.

Bulgu: Okula giden her 10 ergenden 3'ü madde kullanmaktadır; ergenlerin kullandığı temel madde tütün iken, birden fazla madde kullananlar tütün ve uyuşturucu kullanmaktadır. Tütün, hem mevcut hem de geçmişteki kullanıcılar için her zaman en baskın madde olmuştur. Risk faktörleri erkek olmak ve kurallara uymama davranışı iken, bunu ebeveynlerden birinin kaybı ve son olarak da ırk ve Doğu-Malezyalı olmak takip etmektedir. Yüksek depresyon/anksiyete, içe kapanma ve akademik sorunları olan 10 yaş altı topluluklardaki ergenler madde kullanımını %35, %8, %5 ve %2 oranında azaltmıştır. Öngörücü faktörlerin yanı sıra, bu çalışma cinsiyet ve akademik başarı arasında anlamlı bir etkileşim bulmuştur; yüksek akademik başarıya sahip kız çocuklarının madde kullanma olasılığı %6 daha düşükken, erkek çocukları arasında madde kullanımı %6 artmaktadır. Araştırılan değişken, 0.292'lik sözde R2 değeri ile madde kullanımı ile ilişkili değişkenlerin sadece %29.2'sini açıklamaktadır.

Tartışma: Ergenler arasında dünya çapında bir madde kullanımı salgını söz konusudur. Ergenlere yönelik önleme, müdahale ve zarar azaltma programlarının başarılı olabilmesi için ergenlerin maddeleri nasıl kullandığını iyi kavramamız gerekmektedir. Uyuşturucu trafiğinin yoğun olduğu bölgelerde maddelerin bulunabilirliği ve ergenlerin savunmasızlığı, salgının genişlemesini açıklayabilir. Yakın zamanda yapılan bir analize göre, uyuşturucunun yoğun olduğu bölgelerin fazla olması daha fazla kullanıcı anlamına gelmektedir ve bu da bu varsayımı desteklemektedir. Ergenlerin uyuşturucu kullanımı, toplumun desteğine bağlı olarak ülkeden ülkeye değişmektedir. Alkol, çoğu yabancı ülkede yetişkinliğin, sosyal toplantıların ve şenliklerin geleneksel bir yönü olarak yaygın bir şekilde benimsenmektedir. Malezyalı ebeveynlerin görüş ve davranışları ise genç bireyler arasında tütüne başlamayı istemeden de olsa teşvik edebilmektedir. Ergenlerin çoklu madde kullanımı tütün ve uyuşturucuyu içerirken, bu durum uyuşturucu bulunabilirliğinin ve kullanımının genel nüfusa kıyasla çok daha yüksek olduğu uyuşturucunun yoğun olduğu bölgelerin istatistikleriyle örtüşmektedir. Ebeveynler ve büyük kardeşler tarafından öğretilen toplumsal kabul görmüş uygulamalar ve ergenler arasında yeni şeyler denemenin verdiği keyif, sigara ve uyuşturucu kullanımını tüm kullanıcılar arasında yaygın hale getirmektedir. Bireyler, aileler ve toplumlar ergenlerin madde kullanımını etkilemektedir.

Erkek çocuklarının, yeni ve heyecan verici deneyimlere duyulan arzu olarak tanımlanan heyecan arayışı davranışına girme olasılığı daha yüksektir. Öforik etkileri nedeniyle, bazı ergen erkek çocukları ilk kez madde denemeyi düşünebilmektedir. Transgresif ergenler yenilik ve heyecan arayışında olabilir. Kişilik teorisine göre, uyuşturucu tüketmek, kullanıcıların kendilerini ifade etmelerini ve sosyal normları sorgulamalarını sağlayan bir tür bireysellik veya uyumsuzluktur. Bu arada, içine kapanık ergenler tek başlarına faaliyetlerde bulunabilir veya yakın ilişkilerini sürdürebilirler. İyi başa çıkma mekanizmalarına ve duygu yönetimi becerilerine sahip oldukları için madde kullanmadan stres ve olumsuz duygularla baş edebilirler. Yüksek depresyon/anksiyete skorlarına ve akademik sorunlara sahip olan ergenlere, ergen sağlığı taramaları yapılarak uygun terapi ve müdahale sağlanabilir ve böylece okul sağlık ekiplerinin yardımıyla ergenler madde kullanımına karşı korunabilir. Etkili tedavi, altta yatan sorunları ele alabilir ve başa çıkma becerilerini geliştirerek madde kullanımını en aza indirebilir.

Bu çalışmanın etkileşim analizi, akademik puanları daha yüksek olan kız çocuklarının madde kullanma olasılığının daha düşük olduğunu, akademik sorunları olan erkek çocuklarının ise daha yüksek olduğunu göstermektedir. Motivasyon teorisi, akademik zorlukları olan kız ergenlerin neden kendilerini geliştirmek için bu kadar güçlü bir içsel güdüye sahip olduklarına dair en ikna edici açıklamayı vermektedir. Altta yatan sorun nedeniyle, ebeveynler ve eğitmenler, erkek ergenlerin aksine, her zaman bu kız ergenlere odaklanacaktır. Ebeveynlerden birinin ölümü, duygusal destek, yön ve istikrarlarını zorlayarak ergenlerin madde kullanımında artışa yol açabilir. Bu bozulma ergenlerin kendilerini güvensiz veya dengesiz hissetmelerine neden olarak onları madde kullanmaya yönlendirebilir.

Ayrıca, kültürel ve geleneksel faktörler, Doğu Malezya'daki Sabah ve Sarawak'lı yerli halkın madde kullanımının yüksek olmasını en iyi şekilde açıklayabilir. Doğu Malezyalı ergenlerin uyuşturucu kullanma olasılığı daha yüksektir. Bu bölgede madde kullanımının yaygınlığı, nüfusun daha az olması ve yeterli önleme tedbirlerinin alınmaması nedeniyle daha yüksek olabilir. İzole bölgelerde ergenlerin madde kullanımının kurumsallaşması ve kültürün bir parçası haline gelmesi daha olasıdır. Ancak neyse ki, bu topluluklarda 10 yıldan daha az bir süre yaşayan ergenler arasında madde kullanımı daha düşüktür. Bir mahalleye yeni taşınan ergenler, uyuşturucu kullanan arkadaşlarıyla fazla temas kurmamış olabilir. Daha kısa ikamet süreleri, madde kullanan arkadaşlar edinme olasılığını en aza indirebilir.

Sonuç: Bu çalışma, okula giden her 10 Malezyalı ergenden 3'ünün uyuşturucunun yoğun olduğu bölgelerde madde kullandığını ortaya koymaktadır. Bu olgu bireysel, ailesel ve toplumsal faktörlerle ilişkilidir. Bu nedenle, okul çağındaki ergenlerin madde kullanımını azaltmak için daha iyi müdahale programlarına, madde politikalarına ve profesyonel hizmetlere ihtiyacı vardır. Parçalanmış ailelerden gelen erkek ergenler için kültürel olarak uygun, cinsiyet ve aile temelli bir müdahale gereklidir. Bu ergenlerin farkındalık ve eğitime ihtiyacı vardır. Okullar, doktorlar ve toplum grupları ergenlere madde kullanımının zararlarını ve stres yönetimini öğretebilir. Bu eğitimi alan gençler eylemlerini daha iyi değerlendirebilir ve bilinçli kararlar verebilir. Gelecekteki kohort çalışmaları engelli, belgelendirilmemiş ve sorunlu gençleri de içermelidir.