

Substance Use among Undergraduate Students at a Malaysian Public University: Prevalence, Patterns, and Associated Factors in a Cross-Sectional Study from Sarawak

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ABSTRACT

Background: Substance use in university populations is a persistent public health and educational concern because it intersects with risk-taking behavior during emerging adulthood, mental wellbeing, campus culture, and academic functioning. Malaysian evidence remains limited, particularly from East Malaysia. This study estimated the prevalence and pattern of substance use among undergraduate students in a public university in Sarawak and examined factors associated with current use.

Methods: This is a cross-sectional study among undergraduate students at Universiti Malaysia Sarawak between October 2023 and August 2024. A bilingual self-administered questionnaire captured sociodemographic, academic, financial, and psychosocial characteristics, together with substance use using the Alcohol, Smoking and Substance Involvement Screening Test–Lite (ASSIST-Lite). Depression, anxiety, and stress were assessed with the DASS-21, and perceived social support with the Multidimensional Scale of Perceived Social Support. Pearson’s chi-square test was used for bivariate analysis, followed by binary logistic regression for factors associated with current substance use (past 3 months).

Results: A total of 246 students participated (mean age 22.18 years, SD 1.51; 56.1% women). The prevalence of lifetime substance use was 38.2%, while current substance use was 27.2%. Alcohol was the predominant substance for both lifetime use (31.3%) and current use (24.0%), followed by tobacco smoking (7.7% lifetime; 6.1% current). Current use of other psychoactive substances was rare (0.4–0.8% for individual substances). In adjusted analysis, women had lower odds of current substance use than men (adjusted odds ratio [aOR] 0.44, 95% confidence interval [CI] 0.24–0.80). Compared with Malay students, Chinese (aOR 3.44, 95% CI 1.35–8.77), Bumiputera Sarawak (aOR 6.88, 95% CI 2.80–16.86), and other ethnic groups (aOR 3.69, 95% CI 1.39–9.79) had higher odds of current substance use. No statistically significant associations were observed for age

group, living arrangement, academic characteristics, financial variables, psychological distress, or perceived social support.

Conclusions: Substance use among these undergraduates was driven largely by alcohol and, to a lesser extent, tobacco rather than frequent use of illicit drugs. Sex and ethnicity were the most consistent correlates of current use, suggesting that campus prevention strategies should be culturally responsive, gender-sensitive, and focused on alcohol and nicotine as well as illicit substances. Universities should integrate confidential screening, first-year transition support, and targeted health education into student wellbeing programmes.

Keywords: substance use; alcohol; tobacco; university students; Sarawak; Malaysia; student wellbeing

BACKGROUND

Substance use among young adults remains a major global health issue. The United Nations Office on Drugs and Crime estimated that 292 million people used drugs in 2022, with cannabis remaining the most widely used illicit drug worldwide [1]. Beyond illicit drugs, alcohol and nicotine are more commonly encountered among adolescents and university students and often function as the first point of substance exposure. Young adulthood is also a developmental period marked by experimentation, increased autonomy, and heightened social influence, all of which can amplify vulnerability to substance-related behaviors [2,3].

University settings are particularly relevant because students often transition from structured family supervision to more independent living, new peer networks, and greater control over daily decisions. These changes can coincide with academic stress, evolving identities, and greater exposure to social occasions where substance use is normalized. Evidence from the ASEAN region suggests that illicit drug use and binge drinking do occur among university students, although prevalence varies across countries and social contexts [4,5]. At the same time, a recent meta-analysis published in BMC Medical Education reinforced that substance use is not merely a public health problem but also an educational one because it is associated with poorer academic performance and can affect student functioning within the learning environment [6].

Malaysian data show that substance use among youth is not negligible. A nationwide survey among Malaysians aged 15–40 years reported prevalence estimates of 5.5% for lifetime drug or substance use and 3.5% for current use, with cannabis, amphetamine-type stimulants, and kratom among the substances identified [7]. The 2023 National Health and Morbidity Survey also reported ongoing burdens related to tobacco, e-cigarette, and alcohol use in the Malaysian population [8]. However, national estimates may not reflect campus-specific realities because university populations are shaped by peer ecology, residential patterns, institutional culture, and local social norms.

Sarawak provides an especially important setting for study. The state has a culturally diverse student population, and attitudes to alcohol use may differ across ethnic and religious groups. In this context, substance use patterns may not map neatly onto national averages dominated by Peninsular Malaysia. Yet empirical evidence from East Malaysian universities remains sparse. Most Malaysian campus studies have focused on single behaviors such as smoking, or on selected student groups, limiting a fuller understanding of broader substance use patterns [9].

From a medical and educational perspective, understanding campus substance use matters for more than prevalence estimation. Student substance use can affect concentration, class attendance, decision-making, interpersonal conduct, mental wellbeing, and professional development. Educational responses therefore require more than punitive messaging; they require evidence-informed prevention, early identification, and student support strategies embedded within the broader university learning environment [6,10].

This study aimed to estimate the prevalence and pattern of lifetime and current substance use among undergraduate students at a public university in Sarawak and to identify sociodemographic, academic, financial, and psychosocial factors associated with current substance use. We hypothesized that current substance use would vary according to sociodemographic and psychosocial characteristics.

METHODS

Study design and setting

We conducted a cross-sectional study at Universiti Malaysia Sarawak (UNIMAS), a public university in Kota Samarahan, Sarawak, Malaysia. Data collection took place between October 2023 and August 2024. At the time of sampling, UNIMAS had 13,295 undergraduate students across 10 faculties.

Participants and sampling

Eligible participants were undergraduate students enrolled at UNIMAS who agreed to participate. International and Malaysian students were eligible. Students who declined consent were excluded. The minimum calculated sample size was 241 after allowance for non-response. List of all students from 10 faculties were obtained from the administrative office. Subsequently, randomization was conducted using window Microsoft Excel and number of students selected from each faculty were proportionate with their total number of students. Questionnaire was emailed to all the selected students. A total of 246 students completed the survey.

Data collection instruments

A bilingual self-administered questionnaire was delivered online. Substance use was assessed using the Alcohol, Smoking and Substance Involvement Screening Test–Lite (ASSIST-Lite), a brief screening instrument derived from ASSIST 3.1 [11,12]. Psychological distress was measured using the 21-item Depression, Anxiety and Stress Scale (DASS-21), which has acceptable psychometric performance in Malaysian settings [13]. Perceived social support was measured using the Multidimensional Scale of Perceived Social Support (MSPSS), including a validated Malay version [14]. In the pilot study, Cronbach's alpha coefficients were 0.945 for DASS-21 and 0.902 for MSPSS. In the analytic sample, internal consistency remained high (Cronbach's alpha 0.954 for DASS-21 and 0.939 for MSPSS).

Variables

The primary outcome was current substance use, defined as any reported substance use in the past 3 months. Lifetime substance use was also described. Independent variables included age group, sex, ethnicity, living arrangement, faculty, year of study, cumulative grade point average (CGPA), source of financial support, monthly pocket money, levels of depression, anxiety and stress, and perceived social support from friends, family and a significant other.

Statistical analysis

Data were analyzed using SPSS version 29. Descriptive statistics are presented as means with standard deviations (SD) or frequencies with percentages. Pearson's chi-square test was used to assess bivariate associations with current substance use. Variables retained in the final multivariable model were sex and ethnicity, reflecting the statistically significant associations observed in bivariate analysis and the final cleaned model was reported. Adjusted odds ratios (aORs) with 95% confidence intervals (CI) are presented. A two-sided p value <0.05 was considered statistically significant.

Ethics

Ethical approval was obtained from the Ethics Committee of the Faculty of Medicine and Health Sciences, Universiti Malaysia Sarawak. Participation was voluntary, informed consent was obtained electronically before data collection started, and responses were treated as confidential. All data kept by researchers using a password locked computer and only researchers can access to the computer. Data will be permanently deleted by researchers after 5 years duration from the first date of data collection. No individual information will be published or shared in any occasion or situation.

RESULTS

A total of 246 undergraduates participated. The mean age was 22.18 years (SD 1.51), and 56.1% were women. Most respondents lived in a university hostel (74.4%), received financial support from parents (49.2%), and reported monthly pocket money of RM500 or less (65.0%). Approximately three-quarters reported a CGPA of B or above.

The prevalence of lifetime substance use was 38.2% (94/246), while current substance use in the past 3 months was 27.2% (67/246). Alcohol was the most reported substance for both lifetime and current use, followed by tobacco smoking. Current use of other individual psychoactive substances was uncommon.

Participant characteristics

Participant characteristics are shown in Table 1.

Table 1. Characteristics of the study participants (N = 246)

Characteristic	Category	n (%)	Mean $\pm$ SD
Age group	19–20	25 (10.2)	22.18 $\pm$ 1.51
	21–22	121 (49.2)	
	23–24	86 (35.0)	
	≥ 25	14 (5.7)	
Sex	Male	108 (43.9)	
	Female	138 (56.1)	
Ethnicity	Malay	76 (30.9)	
	Chinese	59 (24.0)	
	Iban/Bidayuh/Melanau grouped as Bumiputera Sarawak in regression model	63 (25.6)	
	Other ethnicities	48 (19.5)	
Living arrangement	University hostel	183 (74.4)	
	Rental house	36 (14.6)	
	Parents' house	27 (11.0)	
Main financial support	Parents	121 (49.2)	
	PTPTN loan	59 (24.0)	
	JPA scholarship	45 (18.3)	
	Other	21 (8.5)	
Monthly pocket money	$\leq$ RM500	160 (65.0)	RM582.76 $\pm$ 487.02
	RM501–1,000	70 (28.5)	
	$>$ RM1,000	16 (6.5)	
Year of study	Year 1	79 (32.1)	
	Year 2	37 (15.0)	
	Year 3	88 (35.8)	
	Year 4 and above	42 (17.1)	

Prevalence and pattern of substance use

Table 2 summarizes lifetime and current substance use by substance type.

Table 2. Lifetime and current substance use among respondents

Substance	Lifetime n	Lifetime %	Current n	Current %
Any substance use	94	38.2	67	27.2
Alcohol	77	31.3	59	24.0
Tobacco smoking	19	7.7	15	6.1

Electronic cigarettes/vape	35	14.2	—	—
Cannabis	6	2.4	2	0.8
Cocaine	4	1.6	1	0.4
Amphetamine-type stimulants	3	1.2	1	0.4
Inhalants	3	1.2	0	0.0
Sedatives/sleeping pills	5	2.0	1	0.4
Hallucinogens	1	0.4	0	0.0
Opioids	2	0.8	1	0.4
Kratom	2	0.8	2	0.8

Patterns among lifetime users

Among respondents who had ever used any substance, first use most commonly began during secondary school (64.9%), while 31.9% initiated use during university (Table 3). Curiosity was the dominant self-reported reason for initiation (72.3%), followed by stress relief (42.6%) and peer influence (40.4%). Substance use most often occurred at home (58.5%) or at parties (54.2%). Only 7.4% of lifetime users believed that substance use had negatively affected their academic performance.

Table 3. Reported patterns and reasons among respondents with lifetime substance use (n = 94)

Domain	Item	n (%)
Perceived academic effect	Substance use affected academic performance	7 (7.4)
Perceived academic effect	No perceived academic effect	87 (92.6)
First Use During		
First use	Primary school	3 (3.2)
First use	Secondary school	61 (64.9)
First use	University	30 (31.9)
Occasion of use*	At home	55 (58.5)
Occasion of use*	At parties	51 (54.2)
Occasion of use*	Before examination	4 (4.2)
Occasion of use*	Before sports	1 (1.1)
Reason for initiation*	Curiosity	68 (72.3)
Reason for initiation*	To relieve stress	40 (42.6)
Reason for initiation*	Peer influence	38 (40.4)
Reason for initiation*	Joy seeking	34 (36.2)
Reason for initiation*	Presence of addicted family member	20 (21.3)
Reason for initiation*	Easy access from friends	14 (14.9)
Reason for initiation*	Easy access from family members	12 (12.8)
Reason for initiation*	To reduce shyness	11 (11.7)
Reason for initiation*	Low self-esteem	9 (9.6)
Reason for initiation*	Easy access from dealers	6 (6.4)
Reason for initiation*	Strict parents	5 (5.3)
Reason for initiation*	Parental divorce	1 (1.1)

*Multiple responses were allowed for occasion of use and reasons for initiation.

Bivariate analysis

In chi-square analyses, current substance use was significantly associated with sex and ethnicity, but not with age group, living arrangement, financial variables, academic characteristics, psychological distress, or perceived social support (Table 4).

Table 4. Factors associated with current substance use in the past 3 months

Variable	Category	No n (%)	Yes n (%)	p value
Age group	19–20	14 (7.8)	11 (16.4)	0.190
	21–22	91 (50.8)	30 (44.8)	
	23–24	65 (36.3)	21 (31.3)	
	≥25	9 (5.0)	5 (7.5)	
Sex	Male	69 (38.5)	39 (58.2)	0.006
	Female	110 (61.5)	28 (41.8)	
Ethnicity	Malay	68 (38.0)	8 (11.9)	<0.001
	Chinese	42 (23.5)	17 (25.4)	
	Bumiputera Sarawak	35 (19.6)	28 (41.8)	
	Others	34 (19.0)	14 (20.9)	
Living arrangement	University hostel	132 (73.7)	51 (76.1)	0.927
	Rental house	27 (15.1)	9 (13.4)	
	Parents' house	20 (11.2)	7 (10.4)	
Financial support	Parents	86 (48.0)	35 (52.2)	0.858
	JPA scholarship	35 (19.6)	10 (14.9)	
	PTPTN loan	43 (24.0)	16 (23.9)	
	Other	15 (8.4)	6 (9.0)	
Monthly pocket money	≤ RM500	115 (64.2)	45 (67.2)	0.391
	RM501–1,000	50 (27.9)	20 (29.9)	
	> RM1,000	14 (7.8)	2 (3.0)	
Year of study	Year 1	56 (31.3)	23 (34.3)	0.894
	Year 2	28 (15.6)	9 (13.4)	
	Year 3	63 (35.2)	25 (37.3)	
	Year 4 and above	32 (17.9)	10 (14.9)	
CGPA	2.33–2.66	7 (3.9)	2 (3.0)	0.468
	2.67–2.99	35 (19.6)	19 (28.4)	
	3.00–3.32	61 (34.1)	22 (32.8)	
	3.33–3.66	44 (24.6)	17 (25.4)	
	3.67–4.00	32 (17.9)	7 (10.4)	
Depression	Normal	84 (46.9)	41 (61.2)	0.210
	Mild	31 (17.3)	8 (11.9)	
	Moderate	22 (12.3)	8 (11.9)	
	Severe/very severe	42 (23.5)	10 (14.9)	
Anxiety	Normal	90 (50.3)	43 (64.2)	0.137
	Mild	16 (8.9)	2 (3.0)	
	Moderate	26 (14.5)	10 (14.9)	
	Severe/very severe	47 (26.3)	12 (17.9)	
Stress	Normal	129 (72.1)	50 (74.6)	0.565
	Mild	18 (10.1)	4 (6.0)	
	Moderate	17 (9.5)	9 (13.4)	
	Severe/very severe	15 (8.4)	4 (6.0)	
Friend support	High	84 (46.9)	37 (55.2)	0.505
	Moderate	78 (43.6)	25 (37.3)	
	Low	17 (9.5)	5 (7.5)	
Family support	High	103 (57.5)	34 (50.7)	0.399
	Moderate	64 (35.8)	30 (44.8)	
	Low	12 (6.7)	3 (4.5)	
Significant other support	High	88 (49.2)	30 (44.8)	0.722
	Moderate	70 (39.1)	30 (44.8)	
	Low	21 (11.7)	7 (10.4)	

Multivariable analysis

In the final logistic regression model, women had significantly lower odds of current substance use than men. Ethnicity remained independently associated with current use, with Chinese students, Bumiputera Sarawak students, and students from other ethnic groups showing higher odds than Malay students (Table 5). The model demonstrated acceptable fit (Hosmer–Lemeshow $p = 0.624$) and explained 11.1% to 16.1% of the variance in current substance use.

Table 5. Multivariable logistic regression for current substance use (past 3 months)

Variable	Category	aOR	95% CI	p value
Sex	Male	1.00	Reference	
	Female	0.44	0.24–0.80	0.007
Ethnicity	Malay	1.00	Reference	
	Chinese	3.44	1.35–8.77	0.010
	Bumiputera Sarawak	6.88	2.80–16.86	<0.001
	Others	3.69	1.39–9.79	0.009

DISCUSSION

This study provides one of the few empirical descriptions of substance use among undergraduates in Sarawak. Two findings are especially important. First, more than one-quarter of respondents reported current substance use. Second, the burden observed in this campus sample was driven predominantly by alcohol, and to a lesser extent tobacco, rather than frequent current use of illicit drugs. This distinction matters because public discussion of substance use in Malaysia often defaults to illicit drug narratives, whereas university prevention programmes may need to focus more realistically on legal and socially normalized substances.

The current-use prevalence in this study appears higher than the national estimate reported among Malaysian youth for drug or substance use [7]. However, this comparison should be interpreted cautiously. The present study captured alcohol and tobacco-related behaviors within a university sample, while national surveillance often emphasizes broader youth populations and may frame substances differently. University students are also exposed to a distinct social ecology characterized by greater independence, peer gatherings, celebratory drinking opportunities, and variable supervision. In that sense, the discrepancy does not necessarily indicate a more severe illicit drug problem on campus; rather, it suggests that substance exposure in student life is shaped substantially by alcohol and nicotine availability and acceptability.

Alcohol was the dominant substance for both lifetime and current use. That pattern is consistent with ASEAN university evidence showing that alcohol-related behaviors are a major concern in student populations [5]. It also fits the developmental literature on emerging adulthood, where alcohol commonly becomes embedded within experimentation, social bonding, and leisure [3]. Importantly, the Sarawak context may further influence this pattern. In a multicultural environment, alcohol use is not uniformly viewed across all ethnic and religious groups. Accordingly, the higher prevalence observed outside the Malay reference group should not be interpreted as an intrinsic ethnic predisposition; a more plausible explanation is that differing cultural and religious norms shape both opportunities for use and willingness to disclose use. The independent association between ethnicity and current substance use therefore likely reflects social context rather than ethnicity per se.

The sex gradient observed in the multivariable model is consistent with wider literature showing higher substance use among men than women [2,15]. Explanations are likely multifactorial, including gendered norms around risk-taking, social acceptability of drinking and smoking, and differences in peer-group behavior. From a campus intervention perspective, the implication is not that prevention should target men alone, but that messaging and outreach should recognize that risk presentation may differ by gender and social setting.

One of the more interesting findings was the absence of statistically significant associations with psychological distress or perceived social support. At face value, this may appear inconsistent with literature linking mental

health strain and social environment to substance use [16]. Several explanations are possible. First, the composite outcome of current substance use in this dataset was dominated by alcohol use, which may be episodic and social rather than directly linked to persistent distress. Second, self-reported campus surveys are vulnerable to under-reporting, especially for stigmatized or illegal substances, which can weaken associations. Third, the study may have been underpowered to detect more modest psychosocial effects once use was dichotomized into yes versus no categories. The null findings should therefore not be taken as evidence that psychosocial factors are irrelevant, but rather that they were not demonstrable in this sample using the present design.

Academic variables were also not significantly associated with current substance use. This should again be interpreted carefully. A non-significant cross-sectional association does not mean that substance use is educationally unimportant. The broader literature shows that substance use can compromise academic performance, concentration and learning outcomes [6]. In the present study, only a small minority of lifetime users perceived that their academic performance had already been affected. Self-perception, however, may underestimate more subtle harms such as reduced study efficiency, poorer sleep, missed classes, impaired decision-making, or deterioration in professional behavior. For higher education institutions, the absence of a statistical link in one campus survey should not weaken the rationale for preventive educational action.

The pattern of initiation reported by lifetime users is also noteworthy. Nearly two-thirds first used substances during secondary school, whereas about one-third initiated during university. This suggests that universities inherit a risk profile that often predates admission, but the campus transition remains a meaningful secondary window for initiation. Curiosity, stress relief, and peer influence were the dominant reasons for use, which is consistent with adolescent and young-adult substance use frameworks [16]. For educators and student affairs teams, this means that prevention cannot rely only on disciplinary deterrence. It should also address coping skills, stress management, peer norms, and safer transition into independent living.

These findings have direct implications for medical education and university education more broadly. First, student substance use should be framed as a learning-environment issue, not solely a disciplinary issue. Second, health education on campus should be culturally responsive and avoid one-size-fits-all messaging. Third, confidential screening and referral pathways should be strengthened, particularly during the first year and during periods of heightened academic stress. Fourth, student support services should integrate alcohol and nicotine education into wellbeing programming rather than focusing exclusively on illicit drugs. Finally, institutions that train future health professionals should ensure that substance use education includes not only pharmacological harms but also self-care, professional responsibility, stigma reduction, and pathways to support [10].

Taken together, the study points to a more nuanced campus reality than a simple illicit drug narrative. In this public university in Sarawak, current substance use existed at a meaningful level, but the dominant substances were alcohol and tobacco. The central policy challenge is therefore to respond proportionately: universities need prevention and support systems that are evidence-based, non-stigmatizing, and tailored to the real profile of student substance use on campus.

Strengths and limitations

This study has several strengths. It addresses an understudied university population in East Malaysia, uses established instruments, includes both educational and psychosocial correlates, and reports multivariable analysis rather than descriptive estimates alone.

However, several limitations must be acknowledged. The cross-sectional design precludes causal inference. The study was conducted in a single university, which limits generalizability. Because the final recruitment strategy included convenience and opportunistic sampling, selection bias is possible. All measures were self-reported and may have been affected by recall bias or social desirability bias, especially for stigmatized or illegal substances. The relatively small number of current users for individual illicit substances prevented substance-specific regression analyses. Finally, because the composite outcome was dominated by alcohol-related use, associations specific to illicit drug use may have been obscured.

CONCLUSIONS

Among undergraduates in this public university in Sarawak, lifetime substance use affected more than one-third of respondents and current use affected more than one-quarter. The overall burden was driven mainly by alcohol and tobacco rather than frequent current use of illicit drugs. Sex and ethnicity were the only factors that remained independently associated with current substance use in the final model.

These findings support a shift from generic anti-drug messaging towards culturally responsive, gender-sensitive and student-centered prevention strategies. Universities should priorities alcohol and nicotine risk reduction, early screening, first-year transition support, and access to confidential counselling and referral. Future multi-campus studies with probability sampling would strengthen the evidence base and help determine whether the patterns observed here are specific to Sarawak or reflect a broader Malaysian higher education context.

Declarations

Abbreviations

ASSIST-Lite, Alcohol, Smoking and Substance Involvement Screening Test–Lite; aOR, adjusted odds ratio; CGPA, cumulative grade point average; CI, confidence interval; DASS-21, Depression, Anxiety and Stress Scale–21; MSPSS, Multidimensional Scale of Perceived Social Support; SD, standard deviation; UNIMAS, Universiti Malaysia Sarawak.

Ethics approval and consent to participate

This study was conducted in accordance with the principles of the Declaration of Helsinki. Ethical approval was obtained from the Ethics Committee of the Faculty of Medicine and Health Sciences, Universiti Malaysia Sarawak. Participation was voluntary and anonymous, and informed consent was obtained electronically from all participants prior to participation.

Consent for publication

Not applicable.

Availability of data and materials

The de-identified dataset used and/or analysed during the current study is available from the corresponding author on reasonable request, subject to institutional ethics and confidentiality requirements.

Competing interests

The authors declare that they have no competing interests.

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Authors' contributions

LSH conceived and supervised the study, conducted the analysis, and drafted the manuscript. LWH contributed to data collection and analysis. SFJ and RN contributed to study methodology and manuscript preparation. All authors reviewed and approved the final manuscript.

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