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ORIGINAL ARTICLE

Prevalence of consumption of illicit drugs and associated factors from a nationwide epidemiological survey: The Singapore Health and Lifestyle Survey

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ABSTRACT

Introduction: The primary aims of the current nationwide study were to establish the lifetime and 12-month prevalence of consumption of illicit drugs and its correlates in the general population of Singapore.

Method: A representative sample of 6509 Singapore residents (Singapore citizens and permanent residents) aged between 15 and 65 years were randomly selected for participation. Questionnaires were administered to assess the consumption of illicit drugs and collect information on correlates. All analyses were weighted to produce prevalence estimates for the consumption of drugs and other measured outcomes. Rao-Scott chi-square test and logistic regression analyses were performed to determine the association of sociodemographic and clinical characteristics with lifetime consumption of illicit drugs.

Results: The study was completed with a response rate of 73.2%. The lifetime prevalence of consuming illegal drugs was 2.3% (95% confidence interval [CI] 1.9–2.8) (n=180). Compared to individuals aged 15–34, those aged 50–65 (odds ratio [OR] 0.3, 95% CI 0.2–0.7) had lower odds of lifetime drug consumption. Current smokers (OR 4.7, 95% CI 2.7–8.3) and ex-smokers (OR 5.9, 95% CI 3.2–11.1) had significantly higher odds of lifetime drug consumption than non-smokers. Individuals with hazardous alcohol use (OR 3.3, 95% CI 1.7–6.5) had higher odds of lifetime drug consumption than those without hazardous alcohol use.

Conclusion: This is the first nationwide study to examine the prevalence of illicit drug consumption in the general population of Singapore. The results highlight the need to increase awareness of drug consumption in Singapore, especially among parents, teachers, healthcare workers and others who work with young people.

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Keywords: epidemiology, hazardous alcohol use, illicit drug consumption, Singapore, smoking

CLINICAL IMPACT

What is New

- This nationwide study is one of the first to establish the prevalence of illicit drug consumption in Singapore.
- Our findings highlight that those belonging to the younger age group, current and ex-smokers, as well as those with hazardous alcohol use, were at higher risk of lifetime consumption of drugs.

Clinical Implications

- The results help to inform healthcare workers and others who work with young people on illicit drug consumption in Singapore.
- Our data can help policymaking and further enhance prevention and early detection in the population.

INTRODUCTION

Substance use disorders (SUDs) are characterised by the uncontrolled use of a substance by an individual despite its harmful consequences.[1,2] The prevalence of consumption of substances and SUDs varies widely across countries. This difference in prevalence can be attributed to factors such as study methodology (the substance included in the study, whether survey or administrative data were used), drug policies across countries, and the demographic and cultural profiles of the population.

According to the United Nations Office on Drugs and Crime World Drug Report, in 2020, an

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estimated 284 million people worldwide aged 15–64 (mostly men) had used an illicit drug within the last 12 months.[3] Of the people who had used drugs in the past year, about 13.6% suffered from SUDs.[3] The National Survey on Drug Use and Health (NSDUH) conducted annually in the US found that in 2021, 21.9% of people aged 12 or older (or 61.2 million people) used illicit drugs in the past year. Of these, 16.5% (46.3 million people) had an SUD as defined by the Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition (DSM-5) in the past year.[4] The European Monitoring Centre for Drugs and Drug Addiction (EMCDDA) found that around 28.9% (83 million) of adults (aged 15–64) in the European Union had used illicit drugs at least once in their lifetime. In comparison, 7.7% (22.2 million) had used it in the past year.[5]

On the other hand, data from Asian countries are limited. For example, a survey conducted in 2019 in India suggests that about 2.8% of the population had consumed any cannabis products in the past year, while 2.1% used some form of opioids.[6] In Hong Kong, data on illicit drug consumption come mainly from the Central Registry of Drug Abuse.[7] Data from 2021 reported 6019 drug abusers. Among those reported, 2388 or 41% were reported as heroin abusers, and 4099 or 70% were reported as psychotropic substance abusers.[7]

Several sociodemographic factors have been associated with the consumption of substances. Younger age and male gender are significantly associated with a higher prevalence of consumption of substances.[3,8-10] An Australian-New Zealand study examined the association between frequency of cannabis consumption before age 17 and high school noncompletion, university non-enrolment and degree non-attainment by age 25. The study found that adolescent cannabis consumption (weekly or more) was associated with 1.5 to 2-fold increases in the odds of high school noncompletion, university non-enrolment and degree non-attainment.[11] Individual, community and country-level socioeconomic characteristics can directly or indirectly influence drug consumption. NSDUH found that among persons who reported lifetime use of illicit drugs, persons with a family income less than USD 20,000 were 36% more likely to report having substance use problems compared to those with a family income ≥ USD 75,000.[8]

Singapore, a city-state located at the southern tip of the Malay Peninsula, takes a zero-tolerance stance against drugs by adopting a comprehensive drug control strategy that tackles drug supply and demand. The multipronged strategy is spearheaded through preventive drug education; strict anti-drug laws; rigorous enforcement; international engagement and rehabilitating that includes treating, counselling and reintegrating drug offenders into society.[12] However, information on the consumption of drugs in Singapore is limited to arrest data. According to statistics from the Central Narcotic Bureau, 2826 drug abusers were arrested in 2022. Of these, about 28% (802) were new abusers. Methamphetamine (1451), heroin (994) and cannabis (236) were the most commonly abused drugs.[12] However, no study has examined the prevalence of consumption of illicit drugs (i.e. the non-medical consumption of drugs prohibited by national law) in the Singapore general population. Therefore, the primary aims of the current study were to establish the lifetime (any consumption during the person's life) and 12-month (consumption in the last year) prevalence of illicit drug consumption and its sociodemographic and clinical correlates in the general population of Singapore.

METHOD

Study design

The Health and Lifestyle Survey was a nationwide population survey that was undertaken to establish the prevalence of behavioural and substance addictions among those aged 15–65 years in Singapore. Trained interviewers conducted the survey over 15 months, from April 2021 to July 2022.

Sample size

The sample size for the study was calculated by conducting statistical power calculations for binary proportions to provide a precise estimate of a margin of error (MoE) equal to 0.05 for the overall and sub-groups. We assumed a statistical power of 0.80, with the Type 1 error at α=0.05. The design effect after oversampling by age and ethnicity was 1.765. As no local data on the prevalence rate of drug consumption could be used as a reference, we generated 2 power calculations based on an approximation of prevalence rates between 1% and 2%, respectively. In each calculation, we assumed specific, realistic sample sizes (e.g. n=5500, 6000, 6500) and computed the MoE for key quantities of interest. Using this approach, we determined that a sample size of 6500 would provide sufficient precision to estimate 1–2% of drug consumption with a relative standard error of 11.5–16.4% and an MoE of 0.3–0.5% for the overall prevalence estimate.

Participants

A representative sample of Singapore residents (Singapore citizens and permanent residents) aged between 15 and 65 years were randomly selected from an administrative database. The inclusion criteria were that participants had to be Singapore residents, aged 15–65 years, belonging to any of the 4 ethnic groups in Singapore (Chinese, Malay, Indians and others), and literate in English, Chinese, Malay or Tamil. Exclusion criteria were (1) inability to complete the interview due to severe physical or mental health conditions, (2) illiteracy, (3) hospitalisation or (4) institutionalisation lasting the entire duration of fieldwork.

Survey methodology

A survey firm was employed to conduct the study, and respondents were approached by trained lay interviewers. Participants were sent an invitation letter and subsequently approached using door-knocks. A verbal consent was sought in person. If the participants were willing to participate in the study, a tablet with the survey was handed over to them to complete the questionnaires after the collection of basic sociodemographic data by the interviewer.

However, on 14 May 2021, the research team was informed of the need to suspend face-to-face recruitment due to the imposition of COVID-19-related restrictions. As a result, the team adopted a hybrid approach (face-to-face consent and online questionnaire) for all subsequent interviews. After getting the consent, the interviewers provided the participants with a QR code/hyperlink for accessing the survey as well as a unique code, which the participant had to key in to start the survey. The unique code prevented duplicate attempts or misuse of the link. Participants could not make any changes after submitting the survey.

Questionnaires

The European Model Questionnaire and the guidelines provided by EMCDDA for conducting population surveys of drug use were used to develop a questionnaire that assessed the lifetime and 12-month prevalence of drug consumption.[13] Participants were asked about their consumption of illicit drugs, that is, cannabis, heroin, cocaine, methamphetamine, ecstasy, ketamine, nimetazepam, buprenorphine, new psychoactive substances and prescription drugs (i.e. benzodiazepines/tranquilisers, sedatives/hypnotics/barbiturates and steroids) in their lifetime and in the past year. Misuse of prescription drugs was established using 2 additional questions: (1) was this prescribed by a medical practitioner and (2) did you take more than the prescribed dosage? All those who stated that they had consumed a drug (illicit or licit) ever in their lifetime were asked about their mode of drug consumption, age of initiation of drug consumption and reasons for taking drugs. They were also asked about the severity of drug consumption using a checklist based on the Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition, Text Revision (DSM-IV-TR) criteria for substance use disorder. However, for the current study, we will focus only on the drugs prohibited by national law in Singapore, that is, cannabis, heroin, cocaine, methamphetamine, ecstasy, ketamine, nimetazepam, buprenorphine, new psychoactive substances, and not on the misuse of prescription drugs.

The Patient Health Questionnaire-9 was used to screen for the presence and severity of depression, while the Generalised Anxiety Disorder-7 (GAD-7) was used to screen for generalised anxiety disorder.[14,15] The Insomnia Severity Index was used to assess sleep problems.[16] The Alcohol Use Disorders Identification Test was used to examine drinking habits and hazardous alcohol use.[17] Yes/No questions captured the smoking history, and participants were classified as current, past and never smokers based on their replies. The Chronic Medical Conditions Checklist captured doctor-diagnosed chronic physical conditions and a list of common mental illnesses in Singapore.[18] Please see the details of the questionnaires and the cut-offs used in Supplementary File S1.

Information on the sociodemographic profile of the respondents, including age, gender, ethnicity, living circumstances, marital status and education level, were collected. Data on socioeconomic status (e.g. current occupational status, income and sources of income) were also obtained.

Ethical considerations

Interviewers obtained verbal consent instead of signed written informed consent to prevent any documentation of the participants. Furthermore, no identifiers were collected to ensure that participants could not be linked to their data. A waiver of parental consent was requested and obtained from the institutional review board so that the minors would not feel apprehensive while answering the sensitive questions. All questions had response options, such as "I prefer not to answer" and "don't know" to allow participants to skip any question they felt was sensitive. Encrypted data from the interviews (without identifiers) were stored on the tablets and downloaded weekly by the survey firm to ensure complete confidentiality. Contact details of the respondents

were not shared with the research team, and the survey firm destroyed all contact records after 3 months of completion of the survey.

The National Healthcare Group Domain Specific Review Board (ethics committee) approved the study procedures and provided ethical approval.

Analysis

In order to account for the stratified disproportionate sample design, the data were weighted to adjust for the differential probability of the selection of respondents, non-response and post-stratified by age, gender and ethnicity between the survey sample and the Singapore resident population of 2020. All analyses were based on this weighted sample to produce prevalence estimates for the consumption of drugs and other measured outcomes as well as to describe the sociodemographic profile of the study population. Categorical variables were summarised as weighted percentages and unweighted frequencies. Continuous variables were reported as weighted mean with standard deviation (SD). Rao-Scott chi-square test and logistic regression analyses were performed to determine the association of sociodemographic and clinical characteristics with lifetime consumption of illicit drugs. The results of the logistic regression analyses were provided as odds ratio (OR) and 95% confidence interval (CI). Standard errors were estimated using Taylor's linearisation to adjust for the disproportionate stratified sampling design. All analyses were performed using SPSS Statistics software version 23.0 (IBM Corp, Armonk, NY, US) and Stata/MP version 17.0 (StataCorp, College Station, TX, US) using 2-sided tests at a significance level of 0.05.

RESULTS

A total of 6509 respondents were included in the analysis, with a response rate of 73.2%. The weighted mean age was at 40.9 (SD 14.2) years. Most individuals were aged 15–34 years old (36.3%, n=2404), female (50.8%, n=3353), of Chinese ethnicity (73.6%, n=2130), had degree/professional/post-graduate and qualification (36.4%, n=2035), were married (57.7%, n=3839) and employed/self-employed (75.8%, n=4709). They had a personal income below SGD2000/No income (42.0%, n=2419) (Table 1).

Prevalence of lifetime and past 12-month illicit drug consumption

The lifetime prevalence of consuming illegal drugs was 2.3% (95% CI 1.9–2.8) (n=180). Among those who consumed illicit drugs in their lifetime, the mean age of onset was 19.6 (SD 6.7) years, with 28.9% (n=35) consuming illegal drugs before reaching 18 years of age. The prevalence of lifetime illicit drug consumption was higher among those aged 15–34 years old (2.8%), males (2.9%), those belonging to other ethnicities (5.7%), with tertiary educational qualification (2.5%), separated/widowed/divorced (4.0%), those who were unemployed or temporarily laid off (4.5%), ex-smokers (7.5%) and those with hazardous alcohol use (9.7%) (Table 2).

The past 12-month illicit drug consumption prevalence was 0.7% (n=58). Given the low prevalence, no further analysis was done on this group. The prevalence of illicit drug abuse among those with illicit drug consumption was 23.3%, while that of drug dependence was 13.0% (using DSM-IV-TR criteria).

The first drug consumed and most frequently consumed illicit drug

Cannabis was the most common drug that was first consumed (82.8%, n=70) in the lifetime, followed by methamphetamine (4.5%, n=7) and ecstasy (4.0%, n=3) (Table 3). Among the illicit drugs consumed in the lifetime, cannabis (68.0%, n=45), methamphetamine (15.5%, n=14) and heroin (6.5%, n=10) were most frequently consumed (Table 3).

Sociodemographic and clinical correlates of lifetime illicit drug consumption

Age, ethnicity, employment status, smoking status and hazardous alcohol use were significantly associated with lifetime drug consumption (Table 4). Compared to individuals aged 15–34, those aged 50–65 (OR 0.3, 95% CI 0.2–0.7) had lower odds of lifetime drug consumption. Smokers (OR 4.7, 95% CI 2.7–8.3) and ex-smokers (OR 5.9, 95% CI 3.2–11.1) were more likely to have lifetime drug consumption than non-smokers. Individuals with hazardous alcohol use (OR 3.3, 95% CI 1.7–6.5) had higher odds of lifetime drug consumption than those without hazardous alcohol use.

Those with lifetime drug consumption had higher odds of having clinical anxiety (OR 2.2, 95% CI 1.1–4.6) and clinical insomnia (OR 2.0, 95% CI 1.2–3.4). Those with lifetime illicit drug consumption were more likely to report that a doctor had diagnosed them with depression or major depressive disorder (OR 4.1, 95% CI 2.0–8.6), bipolar disorder (OR 9.6, 95% CI 1.5–60.3), anxiety disorder (OR 3.4, 95% CI 1.4–8.1) and psychosis or schizophrenia (OR 8.8, 95% CI 1.4–56.3) (Table 5).

Table 1. Sociodemographic characteristics of the sample.

		Weighted % (Unweighted n)
Age group	15–34	36.3% (2404)
	35–49	31.3% (2270)
	50–65	32.4% (1835)
Gender	Female	50.8% (3353)
	Male	49.2% (3156)
Ethnicity	Chinese	73.6% (2130)
	Malay	13.7% (2162)
	Indian	9.2% (1911)
	Others	3.5% (306)
Education	No formal education/Primary	7.4% (539)
	Secondary school	23.8% (1555)
	Vocational institute/Institute of Technical Education/Pre-university/Junior college/Diploma/International baccalaureate	32.4% (2289)
	Degree/Professional qualification and post-graduate and above	36.4% (2035)
	Others	0.02% (3)
Marital status	Married	57.7% (3839)
	Single	36.5% (2202)
	Separated/Widowed/Divorced	5.8% (404)
Employment	Employed/Self-employed	75.8% (4709)
	Economically inactive/Students	20.6% (1431)
	Unemployed/Temporarily laid off	3.6% (249)
	Others	0.06% (2)
Personal income	Below SGD2000/No income	42.0% (2419)
	SGD2000–SGD3999	25.0% (1441)
	SGD4000–SGD6999	18.4% (818)
	SGD7000 and above	14.6% (600)

Missing values: education (n=88), marital status (n=64), employment (n=118), personal income (n=1231).
Economically inactive includes housewives and retirees.

DISCUSSION

The current study is one of the first conducted in Singapore to examine the prevalence and correlates of illicit drug consumption. The study found that the prevalence of lifetime and 12-month illicit drug consumption in the population was 2.3% and 0.7%, respectively. The prevalence of illicit drug consumption in Singapore was much lower than that reported in studies conducted in the US, Europe and Australia, which reported rates of 21.4% (in the past year), 28.9% (at least once in their lifetime)[5] and 43% (at some point in their life), respectively.[4,19]

Among respondents who endorsed lifetime illicit drug consumption, cannabis was the most common drug first consumed and the most frequently consumed drug in the lifetime. According to the Alcohol, Drugs and Addictive Behaviours Unit at the World Health Organization, cannabis is the most widely cultivated, trafficked and abused illicit drug globally. About 147 million people, that is, 2.5% of the world population, consume

Table 2. Sociodemographic characteristics of the sample stratified by lifetime illicit drug consumed.

	No illicit drug use (n=6281)	Lifetime illicit drug use (n=180)	*P* value
Age group			0.031
15–34	97.2% (2312)	2.8% (75)	
35–49	97.3% (2198)	2.7% (62)	
50–65	98.6% (1771)	1.4% (43)	
Gender			0.012
Female	98.3% (3269)	1.7% (67)	
Male	97.1% (3012)	2.9% (113)	
Ethnicity			<0.001
Chinese	98.1% (2077)	1.9% (44)	
Malay	97.0% (2080)	3.0% (62)	
Indian	96.9% (1836)	3.1% (57)	
Others	94.3% (288)	5.7% (17)	
Education			0.912
No formal education/Primary	97.7% (517)	2.3% (14)	
Secondary school	98.0% (1497)	2.0% (42)	
Vocational institute/Institute of Technical Education/Pre-university/Junior college/Diploma/International baccalaureate†	97.6% (2213)	2.4% (61)	
Degree/Professional qualification and post-graduate and above	97.5% (1971)	2.5% (60)	
Others	100% (3)	0% (0)	
Marital status			0.222
Married	97.9% (3706)	2.1% (103)	
Single	97.7% (2129)	2.3% (61)	
Separated/Widowed/Divorced	96.0% (386)	4.0% (14)	
Employment			0.008
Employed/Self-employed	97.3% (4532)	2.7% (148)	
Economically inactive/Students	99.1% (1401)	0.9% (20)	
Unemployed/Temporarily laid off	95.5% (235)	4.5% (12)	
Others	100% (2)	0% (0)	
Personal income			0.316
Below SGD 2000/No income	98.0% (2346)	2.0% (59)	
SGD 2000–3999	97.3% (1385)	2.8% (49)	
SGD 4000–6999	97.6% (792)	2.4% (23)	
SGD7000 and above	96.5% (570)	3.5% (28)	

Table 2. Sociodemographic characteristics of the sample stratified by lifetime illicit drug consumed. (Cont'd)

	No illicit drug use (n=6281)	Lifetime illicit drug use (n=180)	*P* value
Smoking status			<0.001
Smoker	94.1% (941)	5.9% (72)	
Ex-smoker	92.5% (401)	7.5% (30)	
Non-smoker	98.7% (4812)	1.3% (75)	
Hazardous alcohol use			<0.001
No	98.0% (5553)	2.0% (138)	
Yes	90.3% (161)	9.7% (21)	

[#] Rao-Scott chi-square test was used to obtain *P* value.
[†] These are pre-tertiary educational qualifications.
Missing values: education (n for no drug use = 80, n for drug use = 3), marital status (n for no drug use = 60, n for drug use = 2), employment (n for no drug use = 111), personal income (n for no drug use = 1188, n for drug use = 21), smoking status (n for no drug use = 127, n for drug use = 3), hazardous alcohol use (n for no drug use = 567, n for drug use = 23).
Economically inactive includes housewives and retirees.

Table 3. First drug used and most frequent drug used (top 3) among those who endorsed lifetime drug consumption.

	Weighted %	Unweighted frequency
What was the first drug that you have used? *		
Cannabis	82.8%	70
Methamphetamine	4.5%	7
Ecstasy	4.0%	3
Which drug did you use most frequently? [#]		
Cannabis	68.0%	45
Methamphetamine	15.5%	14
Heroin	6.5%	10

* 88 respondents with illicit drug use refused to answer this question or stated that they did not know.
[#] 105 respondents with illicit drug use refused to answer this question or stated that they did not know.

cannabis annually, compared with 0.2% consuming cocaine and 0.2% consuming opiates.[20] The short- and long-term consumption of cannabis is associated with several health and social consequences. However, the harm caused by cannabis is often underestimated, which may have contributed to its increased consumption in the past few decades.

Our data also revealed that age, ethnicity, employment status, smoking status and hazardous alcohol use were significantly associated with lifetime illicit drug consumption. The association of drug consumption with the younger age group, smoking and hazardous alcohol use are well-established globally.[3,21] Previous research has found that birth cohort effects are associated with differences in substance consumption, and that these may partially reflect trends in drug popularity, availability and perceptions of reduced harm.[22-24]

A systematic review of epidemiological studies found that among adults, current and lifetime smoking was consistently higher among adults with lifetime, past-year and past-month SUDs compared with other adults.[25] While the systematic review could identify fewer studies examining smoking among adolescents with SUDs, the results were similar to those of adult studies. Similarly, data from the 2015–2017 National Surveys on Drug Use and Health used to examine past-year SUD comorbidity combinations among 12 substances found that the 4 most common SUD combinations included alcohol use disorder.[26]

Table 4. Sociodemographic correlates of lifetime illicit drug consumption.

	OR (95% CI)	*P* value
Age group (in years)		
15–34 (Reference)		
35–49	0.7 (0.4–1.2)	0.208
50–65	0.3 (0.2–0.7)	0.005
Gender		
Female (Reference)		
Male	0.96 (0.6–1.6)	0.880
Ethnicity		
Chinese (Reference)		
Malay	1.1 (0.7–1.9)	0.602
Indian	1.4 (0.9–2.2)	0.170
Others	2.1 (1.1–3.8)	0.023
Education		
Degree/Professional qualification and post-graduate and above (Reference)		
Secondary school	0.6 (0.3–1.3)	0.200
Institute of Technical Education/Vocational institute, pre-university/Junior college, international baccalaureate	0.7 (0.4–1.3)	0.271
No formal education/Primary	0.8 (0.3–2.5)	0.711
Marital status		
Married (Reference)		
Single	0.8 (0.5–1.4)	0.519
Separated/Widowed/Divorced	1.9 (0.7–5.4)	0.210
Employment status		
Employed/Self-employed (Reference)		
Economically inactive/Students	0.4 (0.2–0.9)	0.032
Unemployed/Temporarily laid off	0.7 (0.4–1.5)	0.353
Smoking status		
Non-smoker (Reference)		
Smoker	4.7 (2.7–8.3)	<0.001
Ex-smoker	5.9 (3.2–11.1)	<0.001
Hazardous alcohol use		
No (Reference)		
Yes	3.3 (1.7–6.5)	0.001

Economically inactive includes housewives and retirees.
CI: confidence interval; OR: odds ratio

Table 5. Associations between clinical outcomes and lifetime illicit drug use.

Clinical outcomes	OR (95% CI)	*P* value
Clinical Depression (PHQ-9)	1.5 (0.7–3.1)	0.273
Clinical Anxiety (GAD-7)	2.2 (1.1–4.6)	0.037
Clinical Insomnia (ISI)	2.0 (1.2–3.4)	0.013
Presence of chronic conditions (self-reported)	1.1 (0.7–1.6)	0.825
Depression or major depressive disorder (self-reported)	4.1 (2.0–8.6)	<0.001
Bipolar disorder (self-reported)	9.6 (1.5–60.3)	0.016
Anxiety disorder (self-reported)	3.4 (1.4–8.1)	0.006
Psychosis or Schizophrenia (self-reported)	8.8 (1.4–56.3)	0.022

Adjusted for age, ethnicity, employment status, smoking status and hazardous alcohol use.
Cut-off for various scales are as follows: PHQ-9 (≥10 for clinical depression), GAD-7 (≥10 for clinical anxiety), ISI (≥15).
CI: confidence interval; GAD-7: Generalised Anxiety Disorder -7; ISI: Insomnia Severity Scale; OR: odds ratio; PHQ-9: Patient Health Questionnaire-9

Clinically, assessment and treatment often focus on a substance-specific SUD. However, early diagnosis and intensive treatment of multiple SUDs is of utmost importance. Multiple SUDs are more persistent than individual SUDs and are associated with an elevated risk of developing comorbid psychiatric and physical health problems.[27] Furthermore, multiple SUDs may adversely affect treatment outcomes (e.g. cigarette smoking predicts worse treatment outcomes among those with illicit drug dependence).[28]

Studies conducted elsewhere have reported an association between unemployment and consumption of illicit drugs.[29,30] Our study, on the other hand, found that those who were economically inactive/students were less likely to endorse lifetime drug consumption than those who were employed. Several reasons are possible for this association. First, it is possible that given the stringent laws, access to drugs is not easy, and the cost of illicit drugs may be higher in Singapore. These factors may have limited the consumption among the economically inactive and student category who have limited financial resources. Second, it is possible that the economically inactive group, that is, retirees and homemakers, constitutes a low-risk group who are less likely to take drugs. Third, it is also possible that the use of evidence-based approaches in school to prevent substance abuse and other protective factors, such as having a structured curriculum and school connectedness, could have reduced the risk of consumption of illicit substances in students.[31,32] Last, it is possible that those who start consuming drugs at an early age may drop out of school.[33] This could also lead to the lower association between students and illicit drug consumption observed in the study.

The study also found that illicit drug consumption was associated with poor health outcomes. Those with lifetime drug consumption were more likely to have clinical anxiety (as assessed by GAD-7); clinical insomnia; self-reported, doctor-diagnosed depression; bipolar disorder; anxiety disorder and psychosis/schizophrenia. While several other studies substantiate these associations, the takeaway point is that the consumption of substances is associated with poor health and well-being of the individual.[34-36] However, given this study's cross-sectional nature, we cannot establish causality. While it is possible that substance consumption leads to anxiety, it is also possible that those with anxiety disorders use substances as a form of self-medication.[37,38]

Certain limitations must be kept in mind while interpreting the results of this study. First, this was a household sample, so it excluded residents of nursing homes, hospitals, prisons and those with unstable housing. Second, about 30% of the sample was not interviewed (due to refusal to participate in the study). This non-response could lead to an underestimation of the true prevalence. Third, participants may have under-reported or denied their symptoms. They might be reluctant to share their personal experiences due to either fear of legal repercussions or embarrassment, as alcohol and drug consumption remain stigmatised behaviours in Singapore. Thus, the true prevalence of drug consumption in Singapore may be higher. Fourth, to ensure confidentiality, we only included respondents who were literate and could complete the questionnaires independently. Fifth, the study

results are subjective to recall bias, especially the consumption of substances over a lifetime. Last, this being a cross-sectional study, we cannot determine causality. Thus, the relationship between drug consumption and psychological distress is difficult to establish.

On the other hand, the study has several strengths. First, the study used a nationally representative sample; the response rate of 73% makes our results generalisable to the Singapore population. The team also put in several safeguards to ensure the confidentiality and protection of personal data, which led to the willingness of people to participate and share information about high-risk behaviours. In addition, stringent quality control measures ensured data integrity and data quality.

In conclusion, this is the first nationwide study that has examined the prevalence of illicit drug consumption in the community-dwelling population of Singapore using robust scientific methods. It is essential to maintain a strong commitment to monitoring relevant changes in the prevalence of drug consumption and the early identification of emerging trends in the attitudes towards the consumption of illicit drugs in the future. Such data will further strengthen preventive and treatment efforts across Singapore.

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