



The prevalence and associated factors of new psychoactive substance use: A 2016 Thailand national household survey[☆]



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ABSTRACT

Introduction: Analyzing the situation and risk factors associated with using new psychoactive substances (NPS) is essential for preventing and controlling health consequences. This study explored the prevalence and associated factors of NPS use in the Thai population.

Methods: This descriptive study was conducted in participants (N = 30,411, mean age = 42.4 ± 13.4 years, range = 15–64 years, 50.3% women) from urban and rural areas of Thailand. The participants were chosen using multistage sampling for large populations. The data were collected in July–December 2016 and analyzed using frequency, percentage, mean, standard deviation, chi-square, multiple logistic regression, and odds ratio with 95% confidence intervals (CI).

Results: The prevalence of lifetime NPS use was 49.7% (95% CI, 49.1–51.3), past-year use was 31.3% (95% CI, 30.8–31.8), and current (past-month) use was 14.9% (95% CI, 14.5–15.3). Among current users, 29.5% were habitual users (over 20 days). The factors associated with current NPS use were sex (male/female) (adjusted odds ratio [AOR] = 1.145; 95% CI, 1.075–1.221; p < 0.001), age group (25–64/15–24 years) (AOR = 1.126; 95% CI, 1.090–1.358; p < 0.001), educational attainment (elementary or secondary education and higher) (AOR = 1.634; 95% CI, 1.529–1.747; p < 0.001), and employment status (AOR = 1.842; 95% CI, 1.683–2.016; p < 0.001).

Conclusions: The prevalence of NPS use in Thailand is high, which reflects abuse behavior that could potentially harm users. Understanding the prevalence and risk factors of NPS use could benefit policymakers.

1. Introduction

In 2014, the estimated population who were suffering from drug abuse and drug-related disorders reached over 29 million worldwide, making it a global health challenge. Moreover, 43.5 per million people

die annually from associated drug use (United Nations Office on Drugs and Crime [UNODC], 2016). According to the UNODC's World Drug Report, the annual prevalence of drug use seemed to be stable for the past few years. However, new psychoactive substances (NPS) have increased drastically in both supply and demand (UNODC, 2016).

Abbreviations: NPS, new psychoactive substances; CI, confidence intervals; AOR, adjusted odds ratio; UNODC, United Nations Office on Drugs and Crime; WHO, World Health Organization; OTC, over-the-counter; WHO ASSIST, WHO Alcohol, Smoking and Substance Involvement Screening Test; ACSAN, Administrative Committee of Substance Abuse Academic Network; SD, standard deviation

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Consequently, NPS-related harm has been reported on death certificates recently (United Kingdom Office for National Statistics, 2014).

Archaeological evidence reported the use of a plant-based psychoactive substance to as far back as 50,000 BCE (Merlin, 2003) in Southeast Asia for over 15,000 years (Sullivan & Hagen, 2002). Later, NPS became popular for recreational use. Unlike narcotic and psychotropic drugs, which are illegal,¹ NPS are legal, yet harmful to users (UNODC, 2013a). NPS are substances of abuse, either in a pure form or a preparation, that are not controlled by the 1961 Single Convention on Narcotic Drugs or the 1971 Convention on Psychotropic Substances. NPS could physically harm the users due to addiction and various psychological effects, which could also pose public health threats such as irresponsible driving and violence (World Health Organization [WHO], 2004). According to the above World Drug Report, the number of NPS increased from 126 in 2009 to 450 in 2014 (UNODC, 2015). Although individual countries may account for NPS differently, the UNODC classified NPS into seven categories: synthetic cannabinoids, synthetic cathinones, ketamine, phenethylamines, piperazines, plant-based substances, and miscellaneous substances (UNODC, 2013b).

Among the various substances in Thailand, opium has been recognized for over 600 years (Fine Art Department, 1978). Plant-based products such as cannabis and *Mitragyna speciosa* Korth. leaves (kratom) have also been reported. Synthetic drugs appeared more recently (Poshyachinda, Phitayanon, Simasatitkul, & Perngparn, 1998). As reported in 2004, various prescription drugs can be purchased over-the-counter (OTC) (Narcotics Analysis and Technical Service Institute, 2004. *Internal drug analysis record*. Unpublished statistics. Office of the Narcotics Control Board, Ministry of Justice, Thailand).

In the latest national household survey, 1,233,176 persons had experienced using kratom in their lifetime. Moreover, 88,022 experienced using ecstasy, 41,650 experienced using ketamine, and 76,990 experienced using a “kratom cocktail”² in their lifetime (Administrative Committee of Substance Abuse Academic Network [ACSAN], 2012).

The government of Thailand has regulated drug use through the 1976 Narcotics Control Act and 2002 Drug Abuse Rehabilitation Act (Department of Probation, 2002; Kanato, Nunun, & Momen, 2010). In 2015, the Office of the Narcotics Control Board reported 289,246 drug users who accessed any kind of treatment. Men/boys accounted for 92.1% of the users (Office of the Narcotics Control Board, Surveillance Division, 2015. *Statistics among drug users in Thailand*. Unpublished statistics. Strategy Bureau, Office of the Narcotics Control Board, Thailand). The number of drug users who accessed any kind of treatment accounted for one-third of the past year's number of drug users, in a 2011 national survey (ACSAN, 2012). However, it is currently believed that numerous drug users remain unknown, thus making these numbers underestimates.

¹ Narcotic drugs are controlled by the International Drug Control Conventions on Narcotic Drugs of 1961 as amended by the 1972 Protocol. The convention recommends to the signatory parties the following: “1) should bear in mind that drug addiction is often the result of an unwholesome social atmosphere in which those who are most exposed to the danger of drug abuse live; 2) should do everything in their power to combat the spread of the illicit use of drugs; 3) should develop leisure and other activities conducive to the sound physical and psychological health of young people” (United Nations Office on Drugs and Crime [UNODC], 2013. *The international drug control conventions*. Vienna: UNODC, p. 21.).

The 1971 Convention was adopted to limit the diversion and abuse of certain psychotropic substances, such as central nervous system stimulants, sedative-hypnotics, and hallucinogens, which have resulted in public health and social problems in some countries.

Psychotropic substances or psychoactive drugs are natural or synthetic substances that cause pleasure or reduce pain. Examples of psychotropic drugs include cocaine/crack, amphetamines, opiates, nicotine, alcohol, benzodiazepines, barbiturates, cannabis, hallucinogens, and caffeine. (Psychotropic substances. (n.d.) *McGraw-Hill concise dictionary of modern medicine*. (2002). Retrieved June 10, 2017 from <http://medical-dictionary.thefreedictionary.com/Psychotropic+substances>). With this definition, kratom is categorized as a psychotropic substance.

² Kratom cocktail is made from boiling kratom leaves and mixing with cough syrup, analgesic drugs, sedatives, etc.

Even though a national household survey on drug use has been conducted in Thailand periodically (ACSAN, 2002, 2005, 2008, 2009, 2012), little is known on the prevalence of NPS use. Only ecstasy, ketamine, and kratom were included in those surveys; prescription and OTC drugs were not considered.

Official statistics have shown the decrease of illicit drugs in both trafficking cases and registered patients since 2014; however, this is in contrast with the general perception that the drug problem in Thailand has significantly increased. Therefore, this study set the following objectives.

1.1. Objectives

The primary objective was to determine the prevalence of NPS among the Thai population aged 15–64 years. The secondary objective was to determine the association between NPS use in the past month and the factors associated with it.

2. Materials and methods

This study used data from a national cross-sectional household survey.

2.1. Population and samples

In 2016, the Thai population aged 15–64 years comprised 48,541,501 individuals (sex ratio = 1:1) (Ministry of Interior, Department of Provincial Administration, 2016). Only family members who were staying in the household for > 3 months in 2015 were eligible to participate in the survey.

No NPS survey was conducted prior to this study; therefore, the parameter used was the prevalence of substances used from the previous national household survey in 2011 (ACSAN, 2012). The sample size was calculated to estimate the proportion of NPS use with an estimate of $\pm 1\%$, resulting in a sample of 32,410 individuals. To commence the survey, stratified five-stage cluster sampling was employed. Thailand was stratified into 10 zones. Each zone was systematically sampled down to provinces, subdistricts, and communities. Households were systematically sampling from updated community map. Household members were stratified into male and female, simple random sampling with table was employed to get the samples. Of 32,410 intended samples, 30,411 individuals (93.8%) agreed to participate in the survey.

2.2. Outcome of interest

NPS in this study were unprescribed Analgesics, Cough syrup, Sedatives, Antihistamine, Antihistamine cocktail, Kratom leave, Kratom cocktail, Ecstasy, and Ketamine. The outcome of the study was prevalence of NPS use. The three prevalence periods were lifetime prevalence (taking NPS at least once in their lives), past-year prevalence or recent use (taking NPS at least once in the past 12 months from the interview date), and past-month prevalence or current use (taking NPS at least once in the past 30 days from the interview date). A habitual user of NPS was also defined as a person who was using NPS > 5 days a week on average or > 20 days in the past month.

2.3. Tools

The interview questionnaire, which was developed by 12 experts, comprised seven sections: 1) sociodemographics, 2) general health, 3) attitude, 4) substance use, 5) the WHO Alcohol, Smoking and Substance Involvement Screening Test (WHO ASSIST), 6) treatment history, and 7) criminal experience. The WHO ASSIST was developed for the WHO by an international group of substance abuse researchers (WHO ASSIST Working Group, 2002). The test-retest reliability of the instrument was

0.90. Parts 1, 2, 3, 4, 5, and 7 were conducted 4 weeks later to examine test-retest reliability, which was 0.92 (content validity index = 0.96).

2.4. Data collection

Research assistants were trained to complete fieldwork that included updating a community map, devising a household sampling frame, selecting samples, asking permission for informed consent, and interviewing the sample. The research assistants asked the intended samples to provide written consent, waited a few days to allow participants time to make their decision, and came back to collect the data. Data were collected from July to December 2016 through private, face-to-face interviews in the participants' households. An average of 1–1.5 h was spent with each participant.

2.5. Data analysis

The data were double-entered into a computer and validated. The data set was analyzed by frequency, percentage, mean, standard deviation (SD), multiple logistic regression, odds ratio (OR) with 95% confidence interval (CI), and chi-square.

2.6. Ethics statement

This research project was approved by the Human Research Ethical Committee of Khon Kaen University (approval no. HE581329) and was conducted in accordance with the principles of the Declaration of Helsinki and ICH GCP standards. Written informed consent was obtained from the participants and from the parents/guardians of minors.

3. Results

The participants' characteristics are shown in Table 1. Among the 30,411 respondents who volunteered in the national survey, 50.3% were females (15,294) and 13.6% were adolescents (4132). The mean age was 42.4 years (SD = 13.4). The average monthly income of the family was US \$600 (range, US \$0–21,714).

The categories of NPS use are presented in Table 2. Among NPS,

Table 1
Characteristics of participants in the 2016 Thailand national household survey.

	Male % (n)	Female % (n)	Total % (n)
Age group (years)			
15–19	7.7 (1159)	6.1 (928)	6.9 (2087)
20–24	7.0 (1066)	6.4 (979)	6.7 (2045)
25–44	37.5 (5663)	38.0 (5812)	37.7 (11,475)
45–64	47.8 (7229)	49.5 (7575)	48.7 (14,804)
Education			
Elementary	37.3 (5641)	42.5 (6529)	40.0 (12,170)
High school	37.7 (5704)	34.2 (5225)	35.9 (10,929)
Above high school	25.0 (3772)	23.2 (3540)	24.1 (7312)
Employment status			
Employed	77.8 (11,765)	73.3 (11,217)	75.6 (22,982)
Unemployed	22.2 (3352)	26.7 (4077)	24.4 (7429)
Settlement			
Rural	35.2 (5319)	35.5 (5430)	35.3 (10,749)
Urban	64.8 (9798)	64.5 (9864)	64.7 (19,662)
Health			
Healthy	67.2 (10,161)	64.1 (9808)	65.7 (19,969)
Unhealthy	32.8 (4956)	35.9 (5486)	34.3 (10,442)
Drug treatment			
Ever	14.8 (2244)	14.2 (2164)	14.5 (4408)
Never	85.2 (12,873)	85.8 (13,130)	85.5 (26,003)
Crime involvement			
Ever	16.7 (2519)	14.8 (2260)	15.7 (4779)
Never	83.3 (12,598)	85.2 (13,034)	84.3 (25,632)
Total	100.0 (15,117)	100.0 (15,294)	100.0 (30,411)

analgesics were the most popular non-prescribed psychotropic substances among the respondents. In 4546 current users, sex, age group, educational attainment, and employment status were found to be associated with NPS use. Men were more likely to use NPS than women. As shown in Table 3, the older age groups were more likely to use NPS than the younger. Moreover, those who only attained elementary education were more likely to use NPS currently than those who had higher education. Interestingly, employed people had an almost doubled use of NPS compared with unemployed people. Among current users, 34.8% (1580) were polydrug users.

The characteristics of habitual users of NPS are shown in Table 4. Among past-month users, 29.5% (1341) were habitual users (used NPS over 20 days within the past month). Chi-square tests demonstrated that the differences in sex, employment status, and settlement were statistically significant between habitual and non-habitual users.

4. Discussion

With the aim of exploring the prevalence of NPS use in Thailand, this research revealed that NPS use had an annual prevalence of 31.3%, which was higher than that reported in a recent UNODC report (UNODC, 2016). However, the number may be lower than reality due to response bias.

In Thailand, the use of psychotropic medications or OTC drugs is common; however, these drugs can be potentially harmful if used unnecessarily to alter moods or to get “high.” Among substances that appeared in a prior survey, the use of *Mitragyna speciosa* Korth. (kratom) leaves increased more than twice while “kratom cocktail” increased > 11 times over 5 years. Nonetheless, the prevalence of ecstasy and ketamine remained almost epidemically stable over the past 10 years (ACSAN, 2008, 2012).

The factors associated with the participants' past-month NPS use were sex, age, educational attainment, and employment status. For habitual users, sex, employment status, and settlement were statistically significant factors. Therefore, sex and employment status are important in relation to NPS use.

Compared with men, overall drug use remains low among women. Globally, men are three times more likely to use drugs than women (UNODC, 2014; Van Etten & Anthony, 2001). In Thailand, female drug users accounted for < 10% of all registered drug users (Office of the Narcotics Control Board, Monitoring and Evaluation Division, 2015. *Statistics among drug users in Thailand*. Unpublished statistics. Strategy Bureau, Office of the Narcotics Control Board, Thailand). For NPS, the prevalence between men and women in this study was much closer. In contrast, women were more likely than men to misuse prescription drugs, particularly prescription opioids and tranquilizers (Grella, 2008). Considering the categories of NPS use in Thailand, the use of analgesics, sedatives, and antihistamines without prescription was more prevalent among women than among men.

The association between substance use and employment status has been previously documented (Wu, Schlenger, & Galvin, 2003). The current study showed that the prevalence of substance use in the past months and habitual substance use among employed people were higher compared with unemployed people. NPS are being used for both recreation and daily functioning (perhaps to support occupational activities); therefore, perhaps stimulants are being used to increase productivity.

Furthermore, polydrug use is a prominent issue that can involve unpredictable effects and poses a serious challenge for healthcare providers. A survey of visitors to nightclubs in Rome in 2013 found that NPS were being used in addition to drugs such as cocaine (Vento et al., 2014). In the present study, over one-third of current NPS users were also polydrug users; therefore, NPS-related harm requires further attention.

Table 2
Prevalence of NPS use in people aged 15–64 years in Thailand in 2016.

	Lifetime prevalence % (95% CI)			Past-year prevalence % (95% CI)			Past-month prevalence % (95% CI)		
	Male	Female	Total	Male	Female	Total	Male	Female	Total
NPS	50.7 (49.9, 51.5)	48.8 (48.0, 49.6)	49.7 (49.1, 50.3)	32.9 (32.2, 33.6)	29.8 (29.1, 30.5)	31.3 (30.8, 31.8)	15.8 (15.2, 16.4)	14.1 (13.5, 14.7)	15.0 (14.6, 15.4)
Analgesics	47.9 (47.3, 48.5)	48.3 (47.5, 49.1)	47.5 (46.7, 48.3)	28.1 (27.4, 28.8)	28.2 (27.5, 28.9)	28.1 (27.6, 28.6)	12.2 (11.7, 12.7)	12.9 (12.4, 13.4)	12.5 (12.1, 12.9)
Cough syrup	31.6 (30.9, 32.3)	31.2 (30.5, 31.9)	31.4 (30.9, 31.9)	10.4 (9.9, 10.9)	10.8 (10.3, 11.3)	10.6 (10.3, 10.9)	4.8 (4.5, 5.1)	5.1 (4.8, 5.4)	4.9 (4.7, 5.1)
Sedatives	18.0 (17.4, 18.6)	19.3 (18.7, 19.9)	18.7 (18.3, 19.1)	2.3 (2.1, 2.5)	3.3 (3.0, 3.6)	2.8 (2.6, 3.0)	1.3 (1.1, 1.5)	2.1 (1.9, 2.3)	1.7 (1.6, 1.8)
Antihistamines	15.1 (14.5, 15.7)	15.4 (14.8, 16.0)	15.3 (14.9, 15.7)	0.3 (0.2, 0.4)	0.7 (0.6, 0.8)	0.5 (0.4, 0.6)	0.3 (0.2, 0.4)	0.7 (0.6, 0.8)	0.5 (0.4, 0.6)
Antihistamine cocktail	15.1 (14.5, 15.7)	15.4 (14.8, 16.0)	15.3 (14.9, 15.7)	0.4 (0.3, 0.5)	0.7 (0.6, 0.8)	0.4 (0.3, 0.5)	0.4 (0.3, 0.5)	0.7 (0.6, 0.8)	0.5 (0.4, 0.6)
Kratom leaves	16.0 (15.4, 16.6)	14.3 (13.7, 14.9)	15.1 (14.7, 15.5)	3.9 (3.6, 4.2)	0.4 (0.3, 0.5)	2.1 (1.9, 2.3)	2.6 (2.3, 2.9)	0.2 (0.1, 0.3)	1.4 (1.3, 1.5)
Kratom cocktail	14.8 (14.2, 15.4)	14.2 (13.6, 14.8)	14.5 (14.1, 14.9)	1.2 (1.0, 1.4)	0.1 (0.0, 0.2)	0.7 (0.6, 0.8)	0.7 (0.6, 0.8)	0.0 (0.0, 0.1)	0.4 (0.3, 0.5)
Ecstasy	14.6 (14.0, 15.2)	14.2 (13.6, 14.8)	14.4 (14.0, 14.8)	0.3 (0.2, 0.4)	0.1 (0.0, 0.2)	0.2 (0.1, 0.3)	0.12 (0.06, 0.17)	0.0 (0.0, 0.0)	0.06 (0.03, 0.08)
Ketamine	14.4 (13.8, 15.0)	14.2 (13.6, 14.8)	14.3 (13.9, 14.7)	0.1 (0.0, 0.2)	0.1 (0.0, 0.2)	0.1 (0.1, 0.1)	0.02 (0.00, 0.04)	0.03 (0.00, 0.05)	0.02 (0.00, 0.04)

NPS = new psychoactive substances; CI = confidence interval.

Table 3
Factors associated with past-month NPS users aged 15–64 years in Thailand in 2016.

	Use % (n)	Do not use % (n)	COR	AOR	95% CI	p-Value
Sex						
Male	15.8 (2391)	84.2 (12,726)	1.146	1.145	1.075, 1.221	< 0.001
Female	14.1 (2155)	85.9 (13,139)	1.000			
Age group						
Up to 24	12.3 (507)	87.7 (3625)	1.000			
25 and over	15.4 (4039)	84.6 (22,240)	1.298	1.126	1.090, 1.358	< 0.001
Education						
Elementary	18.6 (2264)	81.4 (9906)	1.608	1.634	1.529, 1.747	< 0.001
Higher	12.5 (2282)	87.5 (15,959)	1.000			
Employment status						
Employed	16.6 (3811)	83.4 (19,171)	1.810	1.842	1.683, 2.016	< 0.001
Unemployed	9.9 (735)	90.1 (6694)	1.000			
Settlement						
Rural	15.8 (1694)	84.2 (9055)	1.103	0.992	0.928, 1.061	0.822
Urban	14.5 (2852)	85.5 (16,810)	1.000			

NPS = new psychoactive substances; COR = corrected odds ratio; AOR = adjusted odds ratio; CI = confidence interval.

5. Conclusions

The prevalence of NPS use in Thailand is high compared with the narcotic epidemic, particularly for prescription psychoactive substances, and reflects abuse behavior that could potentially harm users. NPS use and the factors associated with it are essential in healthcare planning. This study provided information that could be beneficial to the government and nongovernmental agencies in planning and providing appropriate services to the populace. Consequently, understanding NPS use and its related problems will guide authorities to devise effective prevention and control measures. However, further

Table 4
NPS habitual use among past-month users by characteristics.

	Habitual use % (n)	Nonhabitual use % (n)	Total % (n)	p-Value
Sex				
Male	32.2 (771)	67.8 (1620)	100 (2391)	< 0.001
Female	26.5 (570)	73.5 (1585)	100 (2155)	
Age group				
Up to 24	31.8 (161)	68.2 (346)	100 (507)	0.237
25 and over	29.2 (1180)	70.0 (2859)	100 (4039)	
Education				
Elementary	29.6 (669)	70.4 (1591)	100 (2260)	0.897
Higher	29.4 (672)	70.6 (1614)	100 (2286)	
Employment status				
Employed	30.1 (1147)	69.9 (2664)	100 (3811)	0.044
Unemployed	26.4 (194)	73.6 (541)	100 (735)	
Settlement				
Rural	34.4 (582)	65.6 (1112)	100 (1694)	< 0.001
Urban	26.6 (759)	73.4 (2093)	100 (2852)	

research on affected subgroup populations is necessary for implementing more-effective campaigns against NPS abuse.

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