USE OF PSYCHEDELICS IN THE CZECH REPUBLIC: RESULTS OF RECENT POPULATION SURVEYS

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SUMMARY

Objectives: Different psychoactive substances are widely used in today's society. So far limited data are available on the use of psychedelics in the general population. The main aim of this study is to estimate the numbers of users of substances with psychedelic properties (classical psychedelics, cannabis, ecstasy, and ketamine) in the Czech Republic.

Methods: Data from two samples enrolled in representative cross-sectional questionnaire surveys in the Czech adult population in 2016 (n = 2,785) and 2018 (n = 1,665) were analysed. Prevalence rates were extrapolated to estimate numbers of current, i.e., last-year, users of psychedelics, and their socio-demographic profiles were compared with non-users and users of cannabis.

Results: An estimated 5–6% of the Czech adult population (350–430 thousand people) used classical psychedelics (LSD, psilocybin mushrooms, ayahuasca) in their lifetime, increasing up to 28–30% when cannabis is included (1.9–2.1 million users). Current use of classical psychedelics reached 0.7–1.9% (50–130 thousand people), and 9–11% (590–750 thousand users) when cannabis was included. Users of psychedelics were more often males, of younger age and single.

Conclusions: No significant socio-demographic differences were found between users of classical psychedelics and recreational cannabis users, however, differences were significant when compared to non-users and users of other illicit drugs. Findings should further serve to inform drug policy and social and healthcare systems in respect to the use of psychedelics.

Key words: psychedelics, hallucinogens, cannabis, medical cannabis, substance use, epidemiology

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INTRODUCTION

Thanks to their promising therapeutic potential, psychedelics have recently become a focus of research interest. For millennia, psychedelics have been used cross-culturally as an inherent part of various rituals, mainly for religious and medicinal purposes (1–5). Nowadays, despite their current illicit status set by the United Nations Convention on Psychotropic Substances of 1971, psychedelics are still used for variety of reasons such as self-medication and the treatment of various mental health issues outside the official clinical setting (6, 7), personal growth and development, spiritual or religious reasons (8–10), and pain relief (11).

The term "psychedelics" is sometimes used interchangeably with the term "hallucinogens" or "entheogens". The term "hallucinogens" is often used as an umbrella category for all substances able to produce psychedelic effect (12). This effect can occur on the perceptual (e.g., visual distortions, hallucinations, brighter colours, synaesthesia), affective (e.g., mood alterations, emotional release), cognitive (e.g., novel ideas, thoughts or connections, increase in creativity), and behavioural and somatic (e.g., dizziness, tremors) levels (12–14). The character of the resulting experience depends on the type, dosage and route of administration of the specific substance, the user's mindset and the setting (the user's physical and social environment).

Traditionally, psychedelics (sometimes called "serotonergic psychedelics" or "classical psychedelics") include substances producing their effects primarily by acting on serotonin (5-hydroxytryptamine or 5-HT) 2A receptors in the brain (12), such as lysergic acid diethylamide (LSD), O-phosphoryl-4-hydroxy-N,N-dimethyltryptamine (psilocybin), N,N-dimethyltryptamine (DMT), or 5-methoxy-N,N-dimethyltryptamine (5-MeO-DMT). However, some authors (12) include other substances in the broader category of psychedelics as well, e.g., (−)-trans-Δ^9-tetrahydrocannabinol (THC, contained in cannabis), 3,4-methylenedioxy-N-methylamphetamine (MDMA), ketamine, salvinorin A, ibogaine, or deliriants. For the purposes of this text we also

choose to use this broader definition. It should be noted, however, that the above-mentioned substances differ from classical psychedelics in terms of their mechanism of action and to some extent also in their phenomenological and psychological effects.

A psychedelic experience may have short or long-term effects on the mental state, health, behaviour, attitudes, and personality (15–19). Current clinical research suggests a therapeutic potential of psychedelics (e.g., LSD, psilocybin, MDMA) in the treatment of a variety of mental health problems (18, 20, 21), as well as somatic illnesses (mainly cannabinoids) (22). Epidemiological research also reports that having a psychedelic experience is associated with increased positive mental health, while there is no association with increased mental health problems or suicidal behaviour (23–26).

In comparison with other psychoactive substances, the psychedelic substances that are of primary interest in this review (i.e., LSD, hallucinogenic mushrooms, cannabis, MDMA/ecstasy, ketamine) are considered to have a safer profile in terms of harm to users as well as harm to others (27). However, risks related to drug use are generally difficult to assess, as they largely depend on the context of use (28).

With increasing discussion on the therapeutic potential of the psychedelics, there are signs of a growing popularity of psychedelics use in the Czech Republic. Based on data available from population studies, the aim of our paper is to estimate the number of people who have recently used substances with psychedelic effects in the Czech Republic, describe their socio-demographic characteristics, and highlight the differences between the populations of users and non-users. The focus of our paper is on the so-called classical psychedelics such as LSD and psilocybin mushrooms (containing psilocybin), ayahuasca (containing DMT) (29), as well as a broader category of any substance with psychedelic properties which included classical psychedelics, cannabis (containing THC), MDMA/ecstasy and ketamine, as described by Nichols (12).

MATERIALS AND METHODS

Sample

For the purposes of our study, data from two general population surveys carried out in the Czech Republic were analysed – the National Survey on Substance Use 2016 and the Prevalence of Drug Use in the Population of the Czech Republic 2018, both of them carried out by the Czech National Monitoring Centre for Drugs and Addiction.

National Survey on Substance Use 2016

The National Survey on Substance Use 2016 is a cross-sectional questionnaire survey carried out every 4 years on a representative sample of the Czech adult population with focus on tobacco, alcohol and illicit drug use, gaming, and gambling. The sample consisted of 3,601 respondents aged 15+ years, surveyed via face-to-face interviews and pen-and-paper questionnaires (PAPI) in selected households. In line with the European Monitoring Centre for Drugs and Drug Addiction guidelines (30), population aged 15–64 years was selected for the analysis of illicit drug use, resulting in a sample of 2,875 respondents (1,385 males and 1,490 females). A multistage random sampling of the Czech population aged 15+ was applied to obtain a representative sample of the adult population by age, gender, education, and region of residence. Using a random walk approach from sampled starting points in selected municipalities, 6,235 households were contacted. In the last stage, respondents in the contacted households were selected on the basis of the proximity of their birthday to the date of the interview. Response rate after the exclusion of non-eligible households and respondents reached 57.8% (31). The data collection took place from September to November 2016; a pilot test of the questionnaire was conducted among 20 respondents prior to field data collection with the aim to test its length and comprehensibility.

Prevalence of Drug Use in the Population of the Czech Republic 2018

The Prevalence of Drug Use 2018 is a short cross-sectional survey carried out annually since 2011 as part of an omnibus study on a representative sample of the Czech adult population. In 2018, the sample consisted of 2,030 respondents aged 15+ years, surveyed via computer-assisted personal interviews (CAPI) in selected households; among them 1,665 respondents (843 males and 822 females) aged 15–64 years. Quota sampling was applied to obtain a representative sample of the adult population by age, gender, education, region, and population size of the place of residence (32). The data collection took place from April to May 2018.

Ethical Considerations

In both surveys, all participants were informed about the purpose of the study and provided oral informed consent. Particular emphasis was placed on anonymity and voluntary participation; no personal data identifying individual respondents were reported in the questionnaires. The researchers acted in accordance with the legislation of the Czech Republic regarding personal data protection. In the National Survey on Substance Use 2016, the respondents provided their contact details on a separate form, solely for the purpose of random inspections of the interviewers performed by the field work agency. A written parental consent was collected for respondents aged 15–17 years. The current study was approved by the Ethical Committee of the National Institute of Mental Health in the Czech Republic within the scope of the National Psychedelic Research 2019–2021.

Measures

In the general population surveys, the prevalence of use of substances was surveyed in lifetime, in the last 12 months and in the last 30 days. The substances monitored in the National Survey on Substance Use 2016 included cannabis, ecstasy, LSD, hallucinogenic mushrooms, and ketamine, while the Prevalence of Drug Use Survey 2018 specifically focused on ayahuasca, and a joint category of other hallucinogens (including DMT, ibogaine, ketamine, mescaline, peyote, and 5-MeO-DMT).

Based on their self-reported use of substances in the last 12 months, respondents of the National Survey on Substance Use

2016 were categorized into broader groups for further analysis. The following user categories were established:

A – any psychedelic substance including cannabis, i.e., respondents who reported the use of any of the following substances: LSD, hallucinogenic mushrooms, ecstasy, ketamine, and cannabis (n = 309);

B – any psychedelic substance excluding cannabis, i.e., respondents who reported the use of any of the following substances: LSD, hallucinogenic mushrooms, ecstasy, and ketamine (n = 94);

C – classical psychedelics, i.e., respondents who reported the use of LSD and/or hallucinogenic mushrooms only (n = 55).

Similar categories were constructed for the Prevalence of Drug Use Survey 2018; moreover, ayahuasca and other hallucinogens were also included in A and B groups, while ayahuasca only was also included in C category in 2018.

For further comparison of the socio-demographic profile of users, only data from the National Survey on Substance Use 2016 were used. Furthermore, three control groups were constructed for comparison:

K1 – non-users, i.e., respondents who did not use any illicit substance in the last 12 months (n = 2,470);

K2 – users of other (illicit) substances, i.e., respondents who reported the use of methamphetamine, heroin, cocaine, crack, poppers, and/or new psychoactive substances (NPS), excluding psychedelics, in the last 12 months (n = 19);

CA1 – cannabis users, i.e., respondents who reported the use of cannabis only (as a psychoactive drug) in the last 12 months (n = 195);

CA2 – medical cannabis users, i.e., respondents who reported the use of cannabis only for the purpose of self-medication in the last 12 months (n = 49). Only respondents who used cannabis internally were included, leaving out the users of topicals (e.g., creams, oils, ointments etc.).

Data Analysis

Data were analysed in IBM® SPSS® Statistics 25. For both surveys, weights by gender, age, education, population size of the place of residence, and region were applied to minimize the potential selection bias and to increase the representativeness of the samples. Descriptive statistics were performed to describe the prevalence of the use of psychedelic substances among the general population aged 15–64 years; 95% confidence intervals (CI) for the estimates were computed to extrapolate the numbers of psychedelic users in the Czech population.

As a second step, descriptive statistics of the categories of psychedelic users were performed with respect to their socio-demographic characteristics including gender, age, marital status, level of education, population size of the place of residence, region, net monthly income, and economic activity. Socio-demographic profiles of psychedelic users (groups A, B, C) were compared with each other, as well as with control groups (K1, K2, CA1 and CA2).

Due to low number of respondents in some of the categories created, the differences between groups of psychedelic users and control groups were compared using Fisher's exact test; the significance of the differences was evaluated at the 95% level ($p < 0.05$).

RESULTS

Prevalence of Psychedelics Use in the Population

An estimated 28–30% of the Czech population aged 15–64 years reported lifetime use of a substance with psychedelic properties in 2016–2018. Of these, about 26–27% used cannabis, 5–7% used ecstasy, 4–5% used psilocybin mushrooms, and 1–2% used LSD. About 0.2% reported lifetime use of ketamine in 2016, 1% used ayahuasca and 0.5% used other hallucinogens in 2018 (Table 1). The lifetime use of psychedelics after the exclusion of cannabis was reported by 9–11% of the adult population, of these, 5–6% used classical psychedelic (LSD, psilocybin mushrooms or ayahuasca).

When extrapolated to the Czech adult population aged 15–64 years, about 2 million lifetime users of psychedelics (1.9–2.1 million) were estimated, among them 1.80–1.85 million cannabis users, and 640–740 thousand users of psychedelics other than cannabis, including 350–430 thousand users of classical psychedelics.

Recent use of any substance with psychedelic properties, i.e., its use in the last 12 months was reported by 9–11% of the adult population (590–750 thousand users). Use of psychedelics other than cannabis was reported by 1.7–3.3% of the respondents, corresponding to 115–227 thousand people. Classical psychedelics were reported by 0.7–1.9% of the population (50–133 thousand people) (Table 1). Cannabis has been used by 8–9% of the population (550–660 thousand users), while other 8% (approx. 550 thousand) used cannabis for medical purposes (administering the substance internally, excluding external use such as ointments).

Socio-demographic Profile of Psychedelics Users

The profile of psychedelics users differed significantly from that of non-users. Psychedelics users (including cannabis) were more often males (70%), of lower age (mostly aged 15–34 years), single (68%), had achieved lower education (63% had completed elementary or lower secondary education), lived more often with lower net income (39% below 10,000 CZK), or were non-active (39%), and lived in more populated settlements (33% in cities over 100,000 inhabitants) ($p < 0.001$). No significant difference was found in region they lived in.

Users of all categories of psychedelics had rather similar socio-demographic profile, no matter whether they used classical psychedelics only or combined their use with cannabis for non-medical purposes (recreational use). In this respect, users of classical psychedelics did not significantly differ from recreational cannabis users, however, they differed significantly from users of cannabis for medical purposes who were more often females (76%) and of higher age (90% older than 35 years) (Table 2a, 2b).

DISCUSSION

Despite the illicit status of psychedelics, a considerable proportion of the Czech population reports having an experience with these substances in their lifetime (nearly 30% of the adult population, i.e., about 2 million inhabitants aged 15–64 years). Most of them have tried cannabis, followed by ecstasy (including MDMA), and hallucinogenic mushrooms. Classical psychedelics,

Table 1. *Prevalence of use of psychedelics and estimates of number of users (aged 15–64 years) in 2016 and 2018*

Substance(s)		National survey on substance use 2016 (N = 2,875)						Prevalence of drug use 2018 (N = 1,665)					
		n	Prevalence (%)			Estimated number of users		n	Prevalence (%)			Estimated number of users	
			Male	Female	Total	Mean estimate	95% CI		Male	Female	Total	Mean estimate	95% CI
Recreational use of cannabis	Lifetime	764	34.6	19.1	26.6	**1,850,900**	1,738,400–1,963,500	428	31.8	20.6	26.2	**1,805,100**	1,658,100–1,952,000
	LYP	271	14.2	5.0	9.4	**655,000**	580,700–729,400	129	10.0	5.8	7.9	**544,400**	454,300–634,600
	LMP	157	8.9	2.2	5.5	**380,000**	322,200–437,900	38	2.9	1.7	2.3	**160,200**	109,800–210,500
Medical use of cannabis	Lifetime	389	10.3	16.5	13.5	**940,900**	857,300–1,031,500	n/a	–	–	–	–	–
	LYP	236	6.2	10.1	8.2	**571,500**	501,800–641,200	n/a	–	–	–	–	–
	LMP	n/a	–	–	–	–	–	n/a	–	–	–	–	–
Ecstasy	Lifetime	205	10.0	4.4	7.1	**498,100**	432,400–563,700	86	6.8	3.7	5.3	**362,300**	287,700–436,800
	LYP	48	2.4	0.9	1.7	**115,900**	83,300–148,500	15	1.1	0.7	0.9	**64,600**	32,400–96,800
	LMP	10	0.4	0.3	0.3	**23,600**	8,800–38,500	1	0.0	0.1	0.1	**5,200**	0–14,400
LSD	Lifetime	62	3.3	1.1	2.1	**149,300**	112,400–186,100	21	1.2	1.4	1.3	**90,000**	52,100–128,000
	LYP	19	1.0	0.3	0.7	**46,600**	25,900–67,400	3	0.4	0.0	0.2	**11,200**	0–24,600
	LMP	2	0.1	0.0	0.1	**5,100**	0–12,000	2	0.2	0.0	0.1	**6,600**	0–17,000
Hallucinogenic mushrooms	Lifetime	156	8.0	3.0	5.4	**378,400**	320,600–436,100	57	4.7	2.2	3.5	**241,400**	180,000–302,900
	LYP	43	2.5	0.5	1.5	**104,200**	73,300–135,100	6	0.6	0.1	0.4	**24,400**	4,600–44,300
	LMP	5	0.4	0.0	0.2	**11,800**	1,300–22,200	2	0.2	0.0	0.1	**6,600**	0–17,000
Ketamine	Lifetime	5	0.2	0.1	0.2	**12,300**	1,600–23,100	n/a	–	–	–	–	–
	LYP	5	0.2	0.1	0.2	**12,300**	1,600–23,100	n/a	–	–	–	–	–
	LMP	1	0.1	0.0	0.0	**2,400**	0–7,100	n/a	–	–	–	–	–
Ayahuasca	Lifetime	n/a	–	–	–	–	–	16	0.7	1.2	1.0	**66,700**	34,000–99,500
	LYP	n/a	–	–	–	–	–	5	0.1	0.4	0.3	**20,400**	2,300–38,600
	LMP	n/a	–	–	–	–	–	2	0.1	0.1	0.1	**8,500**	0–20,300
Other hallucinogens	Lifetime	n/a	–	–	–	–	–	9	0.4	0.7	0.5	**36,000**	11,900–60,100
	LYP	n/a	–	–	–	–	–	2	0.1	0.0	0.1	**6,600**	0–16,900
	LMP	n/a	–	–	–	–	–	0	0.0	0.0	0.0	–	–

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Table 1. Prevalence of use of psychedelics and estimates of numbers of users (aged 15–64 years) in 2016 and 2018

Substance(s)		National survey on substance use 2016 (N = 2,875)						Prevalence of drug use 2018 (N = 1,665)					
		n	Prevalence (%)			Estimated number of users		n	Prevalence (%)			Estimated number of users	
			Male	Female	Total	Mean estimate	95% CI		Male	Female	Total	Mean estimate	95% CI
A (psychedelics including cannabis)	Lifetime	849	37.9	21.7	29.5	**2,057,400**	1,941,200–2,173,700	461	34.4	22.2	28.3	**1,948,900**	1,798,300–2,099,500
	LYP	310	15.6	6.2	10.8	**749,400**	670,400–828,400	140	15.6	6.2	8.6	**592,500**	498,500–686,400
	LMP	166	9.3	2.4	5.8	**402,400**	342,900–461,900	41	9.3	2.4	2.6	**176,100**	123,200–229,100
B (psychedelics excluding cannabis)	Lifetime	306	14.7	6.9	10.7	**743,100**	664,500–821,700	151	11.7	6.7	9.3	**637,800**	540,900–734,800
	LYP	93	4.8	1.9	3.3	**226,500**	181,300–271,800	27	2.2	1.1	1.7	**115,300**	72,400–158,300
	LMP	17	0.9	0.3	0.6	**40,600**	21,100–60,000	5	0.4	0.2	0.3	**20,500**	2,300–38,800
C (classical psychedelics)	Lifetime	179	9.2	3.4	6.2	**434,500**	372,900–496,100	82	6.2	3.9	5.0	**347,000**	274,200–420,500
	LYP	55	3.1	0.8	1.9	**133,300**	98,400–168,200	11	0.9	0.5	0.7	**49,500**	21,000–77,700
	LMP	6	0.4	0.0	0.2	**14,400**	2,900–26,000	4	0.4	0.1	0.2	**15,200**	0–31,000

LYP – prevalence of use in the last 12 months; LMP – prevalence of use in the last 30 days;
National Survey on Substance Use 2016: A – any psychedelic including cannabis (LSD, hallucinogenic mushrooms, ecstasy, ketamine, cannabis); B – any psychedelic excluding (non-)medical cannabis (LSD, hallucinogenic mushrooms, ecstasy, ketamine); C – classical psychedelics (LSD, hallucinogenic mushrooms). Prevalence of Drug Use 2018 survey: A – any psychedelic including cannabis (LSD, hallucinogenic mushrooms, ecstasy, ketamine, cannabis, ayahuasca, other hallucinogens); B – any psychedelic excluding cannabis (LSD, hallucinogenic mushrooms, ecstasy, ketamine, ayahuasca, other hallucinogens); C – classical psychedelics (LSD, hallucinogenic mushrooms, ayahuasca).

LSD, and hallucinogenic mushrooms have been used in lifetime by estimated 350–430 thousand inhabitants aged 15–64 years. One out of ten inhabitants aged 15–64 has used a psychedelic substance in the last 12 months (around 590–750 thousand people); of them, around 1–2% (50–130 thousand people) are current users of any of the classical psychedelics (LSD or hallucinogenic mushrooms).

The prevalence of use of substances with psychedelic properties in the Czech Republic is similar to the average reported in the European Union, where the average lifetime prevalence was 27.2% (4.3–44.8%) for cannabis, 4.1% (0.6–10.3%) for MDMA and 0.4–4.8% for LSD as reported by EMCDDA (33). Unfortunately, data for other substances that are of interest in this study are not available at the European level. A general population study (on a representative sample of more than 130,000 people) in the US reported the lifetime prevalence of use of classical psychedelics (LSD, psilocybin and psychedelic cacti) at 13.6% (24), which is almost three times higher than in the Czech population. Although psychedelic cacti were not monitored in our study, their inclusion would not make a significant difference.

The use of LSD, hallucinogenic mushrooms and ecstasy has been 2–3 times higher among men compared to women aged 15–64 years. This is consistent with the findings of general population surveys on illicit drugs in general in the Czech Republic (34) and elsewhere (25, 35).

The prevalence of psychedelics and cannabis use observed among young adults (aged 15–24 years) is in line with the findings of the latest wave of the ESPAD school survey carried out in 2019 among 15–16 years old students of whom 28.4% reported lifetime use of cannabis, 3.6% ecstasy use, 3.5% LSD and other hallucinogens use, and 2.5% lifetime use of hallucinogenic mushrooms (36, 37). In line with available research, young age (15–34 years) is often connected with higher sensation seeking (38) which is often associated with higher frequency of risk behaviour, including the use of psychoactive substances (39–43). Moreover, at this age the brain is still more sensitive to changes and external factors, and a variety of psychiatric diseases (such as schizophrenia, anxiety disorders, substance disorders, etc.) are diagnosed and set off in this age group (44, 45). Still, about 13% of the last-year users of classical psychedelics were aged 45–65 years, indicating that the use of psychedelics is not solely associated with younger population.

Single status, lower education and low income of the majority of the users of drugs with psychedelic properties may be associated with the age profile of the majority of users in our study, who were approximately 10 years younger than non-users or users of medical cannabis. A significant part of them may still be studying, which may imply lower or no economic activity, absence of a regular full-time job, and unmarried status. However, it can also imply that a certain part of active users of psychedelics and cannabis may struggle to maintain a steady financial income or have other problems at the labour market.

Users of psychedelic substances, both including and excluding cannabis, significantly differed from users of other drugs excluding psychedelics and cannabis (i.e., respondents who reported the use of methamphetamine, heroin, cocaine, crack, poppers, and/or new psychoactive substances), who were more often females, with higher level of completed education, and living in bigger cities compared to psychedelics users. However, the comparison might be biased by the fact that only a small number of respond-

Table 2a. *Socio-demographic profiles of psychedelic users aged 15–64 years (National Survey on Substance Use 2016, N = 2,875)*

	K1 (non-users; n = 2,470)		K2 (users of illicit drugs; n = 19)			CA1 (recreational cannabis users; n = 195)				CA2 (medical cannabis users; n = 49)				
	n	%	n	%	p1	n	%	p1	p2	n	%	p1	p2	p3
Gender														
Males	1,127	45.6	8	42.1	0.759	132	67.7	**< 0.001**	**0.025**	12	24.5	**0.003**	0.153	**< 0.001**
Females	1,343	54.4	11	57.9		63	32.3			37	75.5			
Age, years														
15–24	326	13.2	5	25.0	**0.043**	64	32.8	**< 0.001**	0.403	1	2.0	**0.027**	**< 0.001**	**< 0.001**
25–34	445	18.0	7	35.0		74	37.9			4	8.2			
35–44	646	26.2	4	20.0		30	15.4			19	38.8			
45–54	518	21.0	4	20.0		17	8.7			13	26.5			
55–64	535	21.7	0	0.0		10	5.1			12	24.5			
Mean age	41.55		33.96		**0.013**	30.99		**< 0.001**	0.268	46.40		**0.011**	**< 0.001**	**< 0.001**
Marital status														
Single	696	28.2	12	63.2	**0.012**	130	66.3	**< 0.001**	**0.035**	7	14.0	0.159	**0.002**	**< 0.001**
Married, registered partnership	1,098	44.5	3	15.8		33	16.8			25	50.0			
Divorced	462	18.7	2	10.5		21	10.7			11	22.0			
Widower/widow	64	2.6	1	5.3		0	0.0			3	6.0			
Partner/mate	150	6.1	1	5.3		12	6.1			4	8.0			
Education														
Elementary or lower secondary	1,091	44.2	8	40.0	0.055	118	60.5	**< 0.001**	**0.015**	21	42.0	0.903	0.257	0.062
Secondary	989	40.0	5	25.0		54	27.7			20	40.0			
University	390	15.8	7	35.0		23	11.8			9	18.0			
Population size of place of residence														
Below 5,000	934	37.8	4	21.1	**0.018**	55	28.2	**0.016**	0.119	21	42.0	0.460	**0.042**	0.058
5–20,000	443	17.9	1	5.3		32	16.4			11	22.0			
20–100,000	575	23.3	10	52.6		53	27.2			12	24.0			
100,000+	518	21.0	4	21.1		55	28.2			6	12.0			
Region														
Prague	300	12.1	2	10.0	0.949	27	13.8	0.061	0.724	4	8.2	0.679	0.942	0.221
Bohemia (except for Prague)	1,292	52.3	11	55.0		115	59.0			26	53.1			
Moravia	879	35.6	7	35.0		53	27.2			19	38.8			

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Table 2a. *Socio-demographic profiles of psychedelic users aged 15–64 years (National Survey on Substance Use 2016, N = 2,875)*

	K1 (non-users; n = 2,470)		K2 (users of illicit drugs; n = 19)			CA1 (medical cannabis users; n = 195)				CA2 (medical cannabis users; n = 49)				
	n	%	n	%	p1	n	%	p1	p2	n	%	p1	p2	p3
Net monthly income (CZK)														
Below 10,000	527	21.4	6	31.6	**0.022**	69	35.9	**<0.001**	**0.032**	12	24.0	0.501	**0.019**	0.185
10–20,000	1,269	51.5	5	26.3		79	41.1			29	58.0			
20–30,000	448	18.2	3	15.8		31	16.1			7	14.0			
30,000+	219	8.9	5	26.3		13	6.8			2	4.0			
Economic activity														
Active	1,814	73.4	11	55.0	0.063	124	63.6	**0.003**	0.449	36	72.0	0.819	0.171	0.265
Non-active	656	26.6	9	45.0		71	36.4			14	28.0			

Table 2b. *Socio-demographic profiles of psychedelic users aged 15–64 years (National Survey on Substance Use 2016, N = 2,875)*

	A (psychedelics including cannabis; n = 309)						B (psychedelics excluding cannabis; n = 94)						C (classical psychedelics; n = 55)					
	n	%	p1	p2	p3	p4	n	%	p1	p2	p3	p4	n	%	p1	p2	p3	p4
Gender																		
Males	216	69.9	**<0.001**	**0.011**	n.a.	**<0.001**	66	70.2	**<0.001**	**0.019**	0.666	**<0.001**	43	78.2	**<0.001**	**0.003**	0.134	**<0.001**
Females	93	30.1					28	29.8					12	21.8				
Age, years																		
15–24	96	31.2	**<0.001**	0.409	n.a.	**<0.001**	29	30.9	**<0.001**	0.494	0.990	**<0.001**	14	25.9	**<0.001**	0.684	0.650	**<0.001**
25–34	120	39.0					38	40.4					25	46.3				
35–44	53	17.2					15	16.0					9	16.7				
45–54	26	8.4					8	8.5					5	9.3				
55–64	13	4.2					4	4.3					1	1.9				
Mean age	30.95		**<0.001**	0.239	n.a.	**<0.001**	30.72		**<0.001**	0.227	0.850	**<0.001**	30.68		**<0.001**	0.208	0.853	**<0.001**
Marital status																		
Single	210	68.0	**<0.001**	**0.003**	n.a.	**<0.001**	65	69.9	**<0.001**	0.246	0.618	**<0.001**	38	69.1	**<0.001**	0.478	0.664	**<0.001**
Married, registered partnership	45	14.6					11	11.8					6	10.9				
Divorced	34	11.0					9	9.7					6	10.9				
Widower/widow	0	0.0					0	0.0					0	0.0				
Partner/mate	20	6.5					8	8.6					5	9.1				

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Table 2b. *Socio-demographic profiles of psychedelic users aged 15–64 years (National Survey on Substance Use 2016, N = 2,875)*

	A (psychedelics including cannabis; n = 309)						B (psychedelics excluding cannabis; n = 94)						C (classical psychedelics; n = 55)					
	n	%	p1	p2	p3	p4	n	%	p1	p2	p3	p4	n	%	p1	p2	p3	p4
Education																		
Elementary or lower secondary	194	62.8	**< 0.001**	**0.007**	n.a.	**0.021**	60	63.8	**0.001**	**0.010**	0.809	**0.039**	34	61.8	**0.025**	**0.011**	0.612	0.101
Secondary	80	25.9					25	26.6					17	30.9				
University	35	11.3					9	9.6					4	7.3				
Population size of place of residence																		
Below 5,000	92	29.7	**< 0.001**	**0.025**	n.a.	**0.025**	34	37.0	**0.029**	**0.002**	0.086	**0.046**	18	32.7	0.051	**0.035**	0.391	**0.028**
5–20,000	48	15.5					15	16.3					7	12.7				
20–100,000	69	22.3					13	14.1					10	18.2				
100,000+	101	32.6					30	32.6					20	36.4				
Region																		
Prague	46	14.8	0.056	0.766	n.a.	0.253	12	12.8	0.875	0.940	0.596	0.629	6	10.9	0.961	0.984	0.404	0.849
Bohemia (except for Prague)	174	56.1					51	54.3					29	52.7				
Moravia	90	29.0					31	33.0					20	36.4				
Net monthly income (CZK)																		
Below 10,000	120	39.1	**< 0.001**	**0.002**	n.a.	0.071	38	40.4	**< 0.001**	**< 0.001**	0.178	0.077	19	34.5	**0.022**	**0.009**	0.357	0.254
10–20,000	118	38.4					37	39.4					22	40.0				
20–30,000	54	17.6					18	19.1					13	23.6				
30,000+	15	4.9					1	1.1					1	1.8				
Economic activity																		
Active	190	61.5	**< 0.001**	0.564	n.a.	0.153	57	60.6	**0.006**	0.641	0.627	0.175	38	69.1	0.470	0.257	0.451	0.867
Non-active	119	38.5					37	39.4					17	30.9				

A – any psychedelic including cannabis (LSD, hallucinogenic mushrooms, ecstasy, ketamine, cannabis); B – any psychedelic excluding (non-)medical cannabis (LSD, hallucinogenic mushrooms, ecstasy, ketamine); C – classical psychedelics (LSD, hallucinogenic mushrooms).

p1 – statistical difference vs. non-users (K1), p2 – statistical difference vs. users of other drugs (K2), p3 – statistical difference vs. cannabis users (CA1), p4 – statistical difference vs. medical cannabis users (CA2); p3 not available for users of psychedelics including cannabis (A) vs. cannabis users (K2) due to overlap of the groups.

ents using illicit drugs other than psychedelics and cannabis was captured in the population survey (n = 19), thus their characteristics may be biased.

Considering the fact that almost one third of the Czech adult population has ever tried substances with psychedelic properties and the substantial potential risks associated with their use, we suggest that more attention should be paid to the needs of this group in order to reduce potential risks and harms. So far, services targeting psychedelic users are very limited in the Czech Republic.

Limitations

This study is based on the analysis of existing data from two general population surveys, and thus analysed substances and their categorization are based on the substances and groups of substances available in original questionnaires. This limits the possibility to get more insight into the patterns and prevalence of use of some psychedelic substances.

Both the National Survey on Substance Use 2016 and the Prevalence of Drug Use in 2018 were cross-sectional questionnaire surveys. Some of the methodological limitations of these surveys should be taken into account. First, a possible selection bias may be present as the population of substance users is hard to reach via a household survey, which may lead to an underestimation of the number of psychedelics users. Second, information bias is present – both evasive answer bias associated with the unwillingness to share sensitive information about personal drug use history and recall bias may lead to an underestimation of the prevalence rates of substance use. Therefore, the estimations of current psychedelic users in the country have to be interpreted with caution. Also central estimates are in some categories based on low numbers of current users captured by household surveys, so there is quite high uncertainty as demonstrated by wide confidence intervals. Sampling error due to low numbers in some groups might by present, and thus characteristics of some small groups or comparison between groups should be considered with caution.

Uncertainty is also present as regards actual use of some of the reported drugs. The main active substance in ecstasy is expected to be MDMA and thus "ecstasy" is regarded as a slang term for MDMA, but some ecstasy tablets may contain little to no MDMA and may even contain different substances such as amphetamines, heroin, cocaine, methamphetamine, or other unknown substances (46–48). The same may concern also other illicit drugs including classic psychedelic substances such as LSD, ayahuasca or synthetic psilocybin analogues.

CONCLUSION

A considerable number of adults in the Czech Republic have used substances with psychedelic effect despite their illicit status. Current users of psychedelics, accounting for 590–750 thousand adults, significantly differ from the population of non-users, being more often males, younger, single, with lower education, and low income, although the differences in education and income may be largely age-related. However, users of classical psychedelics (LSD and hallucinogenic mushrooms) did not differ from recreational cannabis users. Further research is needed to explore patterns of use of these substances and the users' awareness of risks and benefits related to psychedelic use as well as the health consequences, related treatment needs and the provision of such treatment. The data should further serve to inform drug policy and social and healthcare systems in considering possible changes in the legal regulation of psychedelics and cannabis.

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Conflict of Interest

None declared

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