

## Prevalence and Pattern of Psychoactive Substances Use among Outpatients of Addiction Management Clinic in Assiut University Hospital: A Cross-Sectional Study

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### Abstract:

**Background:** The use of psychoactive substances has led to legal measures. Government regulations on manufacturing, supply, and prescriptions aim to reduce the excessive use of psychoactive substances; global efforts to combat the trafficking of psychoactive substances and to track the manufacturing of new types of them.

**Aim:** The current study aimed to determine the new pattern of psychoactive substance use among drug users, socio-demographic characteristics of such population, and correlate substance use with different items of addiction severity index.

The study is a cross-sectional study that included 422 patients from Assiut Government. Data were collected from September 1<sup>st</sup>, 2019, to August 31<sup>st</sup>, 2020, at the outpatient clinic of the Addiction Management Unit of the Psychiatry Department, Assiut University Hospital, Assiut, Egypt. For all eligible participants, the socio-demographic data, history of substance use, psychiatric history, Addiction Severity Index, and MSE of the participants were collected.

**Results:** The lifetime prevalence of new psychoactive substance use is 1.7%. Strox represents 1.2% and 0.5% for Voodoo. The study reports other substances like pregabalin (8.1%), intravenous cycloplegics (5.9%), gabapentin (2.1%), modafinil (0.7%), pheniramine maleate (0.7%), and trihexyphenidyl (0.5%).

**Conclusion:** In this study, we observed that the pattern of new psychoactive substance use was found to be minimal and did not cause dependence but only occasional use.

**Keywords :** Prevalence, Psychoactive Substances Use, Addiction.

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### Introduction:

Substance use is a global public health problem with many causes and motivations. This problem affects all countries regardless of their level of development and culture or education (1).

The United Nations Office on Drugs and Crime (UNODC) recently published the World Drug Report, which shows that more than 35 million people suffer from drug addiction. Although drug use appears to have remained stable in recent years, both the

supply and demand for new psychoactive substances (NPS) have increased significantly(2), although it is not regulated by the 1961 Convention on Narcotic Drugs or the 1971 Convention on Psychotropic Substances.

Regarding the classification of NPS, substances are generally classified according to their pharmacological properties into synthetic cannabinoids, stimulants, sedatives, hallucinogens, and dissociative drugs. However, this classification also includes synthetic drugs, synthetic opioids, GABA A

and GABA B receptor agonists, and herbal/botanical and dietary supplements (3).

The use of new psychoactive drugs (NPS) in Egypt is wider than previously thought. Recent research has revealed the existence of NPS, commonly known as "Strox" or "Egyptian Spice," and other products such as Voodoo. According to the Ministry of Social Solidarity, addiction treatment counts 4.3% of the 10,400 patients who sought help in 2017 were related to Strox use. However, there is currently no comprehensive research on the extent of NPS dependence in Egypt (4). Therefore, the study aims to determine the prevalence of NPS use among drug users and its correlates.

## 2.0. Methods:

The present study was a cross-sectional study registered with ClinicalTrial.gov (NCT03695419). This study was conducted at Assiut University Hospital, Egypt, between 1<sup>st</sup> September 2019 and 31<sup>st</sup> August 2020. The research project was approved by the Assiut University Medical Ethics Review Board. (IRB No.:17100607).

Sample size calculation was made using the 3<sup>rd</sup> version of Open Epi software. Based on previous research by Wonguppa and Kanato (6) on the prevalence of new psychoactive substance use in Thailand, this study showed a prevalence of 49.7% with a confidence level. 95%, and the sample size is 384. Since we expect a 10% loss, the sample size will increase to 422.

## Aim of the Study:

This study aims to assess:

1. Detection of new patterns of psychoactive substance use among drug users.
2. Determine the socio-demographic characteristics of those people.
3. Correlate substance use disorder with different items of the addiction severity index.

**Participants:** Included drug users aged  $\geq 18$  years attending the outpatient clinic of addiction and accepting participation in the study. Patients who were presented with overdose were asked to participate in the study after their recovery.

Exclusion criteria: Patients under the age of 18 and those who refused to participate in the study.

## 2.2. Registration:

Written informed consent was obtained from all participants who met the eligibility criteria after the study objectives and procedures were explained in detail. Afterwards, Patients who met the inclusion criteria received:

1. Socio-demographic history: Specific questions designed to identify social factors.
2. Substance use history: Two prevalence periods were conducted in the study: lifetime prevalence (taking substance at least once in their life) and past-year prevalence (taking substance at least once in the past 12 months from the interview date). Regarding usage patterns, the study looked at dependence and occasional use (patients who use the substance as experimentation once or multiple times but are never dependent on it).
3. Addiction Severity Index (5): The Addiction Severity Index (ASI) is a multidimensional instrument that measures six problems (medical, work/support, alcohol/drugs, family/relationships, legal, and psychological mental illness).
4. Urine testing: Urine samples were collected from all participants without prior notice during the interview to avoid substitution of the drug-free sample. Urine samples were collected in sterile containers, and a one-step qualitative test was performed using enzyme amplification immunoassay technology (EMIT). However, this test cannot detect new psychoactive substance, gabapentinoids, or prescribed drugs.

Patients were interviewed using a predesigned questionnaire. There are three sections of this questionnaire, each with a specific purpose. The first part focused on collecting general information, including demographic characteristics, medical history, and drug use history. Second, it uses legal

evaluation to assess the impact of individuals with substance abuse with regard to illegal and criminal behaviors. The third part focuses on mental health history and psychiatric examination to identify symptoms of depression, anxiety, or psychosis during the interview.

### 2.3. Statistical Analysis:

Data were entered into a Microsoft Excel database, and the Statistical Package for the Social Sciences (SPSS Inc., Chicago, version 24) was used. Quantitative variables were defined as mean  $\pm$  standard deviation and positive values as numbers and percentages. The Chi-square/Fisher exact test was used to compare frequency distributions between groups, and the student's t-test analysis was used to compare binary data. P value < 0.05 was considered significant.

### 3.0. Results:

The mean age of the studied participants was  $31.13 \pm 8.1$  years; patients aged 26-40 years represented the majority of cases (63.5%). Regarding sex, 98.3% were males, and 1.7% were females (Table 1).

Regarding the lifetime prevalence of substance use, most patients reported lifetime use of tramadol (70.4%), followed by Cannabis (66.8%). As regards new psychoactive substances, Strox represents 1.2%, and Voodoo represents 0.5%. Other substances like pregabalin (8.1%), intravenous cycloplegics (5.9%), gabapentin (2.1%), modafinil (0.7%), pheniramine maleate (0.7%), and trihexyphenidyl (0.5%) are reported respectively, but in a small percentage (Table 2 and Fig. 1).

**Table (1):** Socio-demographic Characteristics of the Studied Sample

Variable	Category	n = 422
<b>Age in years</b>	Mean $\pm$ SD	31.13 $\pm$ 8.1
	Median (Range)	30 (18 – 65)
<b>Age Group</b>	18-25 years	103 (24.4%)
	26-40 years	268 (63.5%)
	> 40 years	51 (12.1%)
<b>Sex</b>	Male	415 (98.3%)
	Female	7 (1.7%)
<b>Residence</b>	Urban	201(47.6%)
	Rural	221 (52.4%)
<b>Educational Status</b>	Illiterate	32 (7.6%)
	Low Education	304 (72%)
	High Education	86 (20.4%)
<b>Marital Status</b>	Single	167 (39.6%)
	Married	251 (59.5%)
	Divorced	4 (0.9%)
<b>Employment</b>	Employed	357 (84.6%)
	Government employees	47(11.1%)
	Free workers	310(73.45%)
	Unemployed	65 (15.4%)

**Table (2):** Lifetime Prevalence of Substance Use Disorder \*more than one substance use was allowed

Substance	Num.	Percentage*	Substance	Num.	Percentage
Tramadol	297	70.40%	*Strox	5	1.20%
Cannabis	282	66.80%	*Voodoo	2	0.50%
Heroin	177	41.90%	Decongestant (psuedoephedrine)	8	1.90%
Opium	146	34.60%	Eszopiclone (night calm)	6	1.40%
Alcohol	97	23%	Nalbuphine (Nalufin)	8	1.90%
Benzodiazepines	66	15.60%	Pheniramine maleate (Avil)	3	0.70%
*Methamphetamine	54	12.80%	Trihexyphenidyl (Parkinol)	2	0.50%
*Pregabalin	48	11.40%	Modafinil	3	0.70%
*Cycloplegics	27	6.40%	Propofol	3	0.70%
*Gabapentin	10	2.40%			

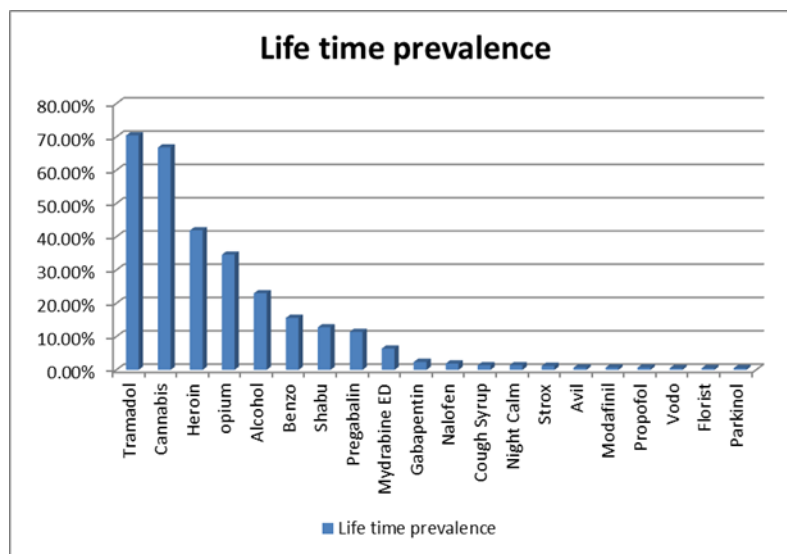


Fig. (1): Lifetime Prevalence of Substance Use among the Studied Sample

As regards past year prevalence, cannabis use disorder (55.5%) was the most common substance use disorder, and tramadol (45.7%) was the second one. Heroin (38.9%), Opium (30.6%), Alcohol

(14.2%), methamphetamine (12.1%), benzodiazepines (11.4%), pregabalin (8.1%), cycloplegics (5.9%) and others are reported. (Table 3 and Fig. 2).

**Table (3):** Past Year Prevalence of Substance Use Disorder \*more than one substance use was allowed

Variable	Num.	Percentage*	Variable	Num.	Percentage
Cannabis	234	55.50%	*Strox	5	1.20%
Tramadol	193	45.70%	*Voodoo	2	0.50%
Heroin	164	38.90%	Pseudoephedrine	9	2.10%
Opium	129	30.60%	Eszopiclone (night calm)	6	1.40%
Alcohol	60	14.20%	Nalbuphine	7	1.70%
Benzodiazepines	48	11.40%	Pheniramine maleate (Avil)	3	0.70%
Methamphetamine	51	12.10%	Trihexyphenidyl (Parkinol)	2	0.50%
Pregabalin	34	8.10%	Modafinil	3	0.70%
Cycloplegics	25	5.90%	Propofol	3	0.70%
Gabapentin	9	2.10%			

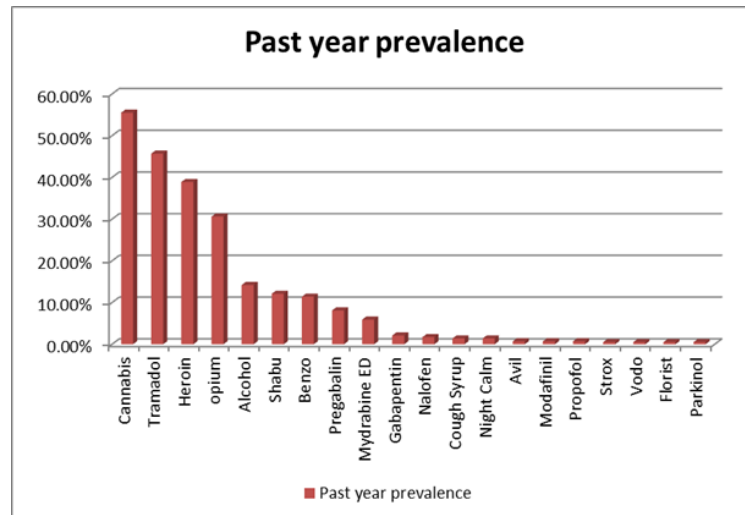


Fig. (2): Past Year Prevalence of Substance Use among the Studied Sample

**Table 4** shows the dependence versus occasional use of substances, and we found that tramadol use disorder is the most common substance use disorder documented (45%), followed by Heroin (38.9%) and Cannabis (35.1%). Occasional use was

evident in Cannabis (20.4%) and Alcohol (10.9%). As regards the pattern of new psychoactive substance use, Strox and Voodoo, no one fulfills the criteria of drug dependence. Occasional use was only documented.

**Table (4): Drug Dependence versus Occasional Use of Substance**

Variable	Dependence		Occasional use	
	Number	Percentage	Number	Percentage
Tramadol	190	45%	3	0.7%
Heroin	164	38.9%	0	0%
Cannabis	148	35.1%	86	20.4%
Opium	119	28.2%	10	2.3%
Methamphetamine	47	11.1%	4	1%
Benzodiazepines	45	10.7%	4	0.9%
Pregabalin	30	7.1%	6	1.4%
Cycloplegics	26	6.2%	0	0%
Alcohol	14	3.3%	46	10.9%
Gabapentin	8	1.9%	1	0.2%
Naluphine (nalufin)	7	1.7%	0	0%
Psuedoephedrine	5	1.2%	4	1%
Eszopiclone (night calm)	6	1.4%	0	0%
Propofol	3	0.7%	0	0%
Pheniramine maleate (Avil)	3	0.7%	0	0%
Modafinil	3	0.7%	0	0%
Trihexyphenidyl (Parkinol)	2	0.5%	0	0%
Strox	0	0%	5	1.2%
Voodoo	0	0%	2	0.5%

The relationship between the socio-demographic characteristics of the studied participants and substance use is summarized in Table 5. Tramadol was common among married rural patients, Cannabis was more prevalent among younger aged (18-25y) unmarried patients, Opium use was more prevalent among older aged patients (> 40y),

Heroin was more prevalent among younger aged (18-25y) illiterate/low educational level unmarried patients, Methamphetamine use was more widely spread in patients living in rural areas, and Benzodiazepines was common among unmarried patients; meanwhile, Alcohol and cycloplegics use showed no significant difference according to the socio-demographic characteristics of the studied participants.

**Table (5):** Relationship between Socio-demographic Characteristics of the Studied Participants and Substance Use

SUD	Age Group			P-value <sup>1</sup>	Educational level		P-value <sup>2</sup>	Occupation status		P-value <sup>3</sup>	Marital status		P-value <sup>4</sup>	Residence		P-value <sup>5</sup>
	18-25 years (n= 103)	26-40 years (n= 268)	> 40 years (n= 51)		Illiterate /Low (n= 366)	High (n= 86)		Employed (n= 357)	Unemployed (n= 65)		Unmarried (n= 171)	Married (n= 251)		Urban (n= 201)	Rural (n= 221)	
Tramadol	35.9	47.0	52.9	0.075	46.7	38.4	0.165	44.5	47.7	0.685	39.2	49.0	0.046	38.3	50.7	0.014
Cannabis	45.6	32.8	25.5	0.021	33.9	39.5	0.331	33.1	46.2	0.042	43.3	29.5	0.004	36.3	33.9	0.609
Alcohol	3.9	3.0	3.9	0.900	3.6	2.3	0.585	3.4	3.1	0.906	3.5	3.2	0.856	4.0	2.7	0.469
Opium	16.5	30.6	39.2	0.005	29.2	24.4	0.383	28.9	24.6	0.485	26.9	29.1	0.625	27.4	29.0	0.716
Cycloplegics	3.9	6.0	11.8	0.075	6.8	3.5	0.248	5.9	7.7	0.577	8.8	4.4	0.066	5.5	6.8	0.489
Heroin	50.5	37.3	23.5	0.004	41.4	29.1	0.037	39.5	35.4	0.532	46.8	33.5	0.006	44.3	33.9	0.029
Methamphetamine	11.7	11.9	5.9	0.402	12.2	7.0	0.169	12.0	6.2	0.165	8.2	13.1	0.112	5.5	16.3	<0.001
Benzodiazepines	9.7	12.3	3.9	0.192	11.3	8.1	0.395	11.5	6.2	0.2	15.8	7.2	0.005	10.4	10.9	0.891

Regarding the addiction severity index, higher severity of unemployment state had a significant correlation with dependence on IV Cycloplegics (P=0.002), Opium (P=0.033), Methamphetamine (P=0.044), and Heroin (P=0.045). Higher severity of drug use was significantly correlated with the use of Opium (P < 0.001), IV Cycloplegics (P= 0.01), and Heroin (P < 0.0001); meanwhile, mild to moderate

severity of drug use significantly correlated with using Tramadol (P < 0.0001). Legal troubles and higher severity ASI-family state were documented in Opium and Benzodiazepine users. A high severity index of psychiatric state was documented among Cannabis users, and mild to moderate severity was significantly correlated with Heroin users (Table 6).

**Table (6):** Evaluation Result of Addiction Severity Index among the Substance Abusers

SUD	seizure	P-value <sup>1</sup>	ASI Medical Status			P-value <sup>2</sup>	ASI Employment Status			P-value <sup>3</sup> M-m Severity (n= 13)	ASI Drug use		P-value <sup>4</sup> M-m Severity (n= 97)	ASI Legal Status	P-value <sup>5</sup>	ASI Family Social Status	P-value <sup>6</sup>	ASI Psychiatric Status	P-value <sup>7</sup>
			Zero Severity (n= 392)	M-m Severity (n= 27)	High Severity (n= 3)		Zero Severity (n= 345)	M-m Severity (n= 35)	Zero Severity (n= 409)		M-m Severity (n=170)	Zero Severity (n= 237)		High Severity (n= 88)		Zero Severity (n= 169)	M-m Severity (n= 113)	High Severity (n= 140)	
Tramadol	100	S	42.9	70.4	100.0	HS	45.8	42.9	44.5	61.5	NS	47.7	40.2	43.2	NS	47.9	38.1	47.1	NS
Cannabis	58.3	NS	34.9	40.7	0.0	NS	34.5	40.0	34.2	61.5	NS	32.9	35.1	40.9	NS	31.4	28.3	45.0	S
Alcohol	41.7	NS	3.1	7.4	0.0	NS	3.2	8.6	3.4	0.0	NS	3.4	6.2	1.1	NS	4.1	2.7	2.9	NS
Opium	33.3	NS	28.6	25.9	0.0	NS	25.8	45.7	26.4	84.6	HS	23.6	26.8	42.0	S	23.1	29.2	33.6	NS
Cycloplegics	0	NS	6.5	0.0	0.0	NS	4.3	5.7	6.1	7.7	NS	5.1	10.3	4.5	NS	4.1	9.7	5.7	NS
Heroin	16.7	NS	40.8	14.8	0.0	S	36.8	42.9	39.1	30.8	NS	42.6	34.0	34.1	NS	39.6	47.8	30.7	S
Methamphetamine	8.3	NS	11.2	7.4	33.3	NS	12.5	8.6	11.0	15.4	NS	11.4	11.3	10.2	NS	13.0	9.7	10.0	NS
BENZODIAZEPINES	33.3	NS	10.2	14.8	33.3	NS	10.4	8.6	9.8	38.5	S	7.6	11.3	18.2	S	6.5	13.3	13.6	NS

**Table (7):** Prevalence of Psychiatric Comorbidity in Patients with Substance Use Disorders

	Psychiatric Comorbidity			P-value*
	None (n= 162)	Depression/Anxiety (n= 216)	Psychosis (n= 44)	
Tramadol	76 (46.9%)	103 (47.7%)	11 (25%)	0.019*
Cannabis	52 (32.1%)	73 (33.8%)	23 (52.3%)	0.039*
Alcohol	7 (4.3%)	7 (3.2%)	0 (0%)	0.191
Opium	35 (21.6%)	71 (32.9%)	13 (27.5%)	0.054
Cycloplegics	5 (3.1%)	19 (8.8%)	2 (4.5%)	0.177
Heroin	65 (40.1%)	87 (40.3%)	12 (27.3%)	0.249
Methamphetamine	22 (13.6%)	14 (6.5%)	11 (25%)	0.001*
BENZODIAZEPINES	9 (5.6%)	32 (14.8%)	4 (9.1%)	0.015*

**Table (7)** shows that depressive and anxiety symptoms significantly correlated with the use of Tramadol ( $P=0.019$ ) and Benzodiazepines ( $P=0.015$ ). Psychosis significantly correlated with use of Cannabis ( $P=0.039$ ) and Methamphetamine ( $P=0.001$ ).

#### 4.0. Discussion:

Information regarding NPS use in Egypt is scarce; an attempt was made in the current study to record the prevalence of NPS there and the characteristics of the population.

The current study also shows the emergence of substances that were not previously documented in previous studies by *Hamdi et al.*, such as methamphetamine, new psychoactive substances such as Strox

and Voodoo, and prescribing drugs like pregabalin, gabapentin, nalbuphine, pseudoephedrine, anti-histaminic, and anticholinergic. (7)

Although the use of new psychoactive drugs (NPS) has changed from what it was, its use remains less than opioids. The use of controlled substances is more common. In 2018, only 0.5% of adults in England and Wales reported using NPS, mostly synthetic

cannabinoids. By comparison, 7.6% of adults reported using marijuana, and 2.9% also reported using cocaine. (8) Although this rate is relatively low, a study of patients admitted to drug treatment centers in Germany showed that synthetic cannabinoids were used as "sweeteners" in 32.1% of patients. (9)

In the present study, the lifetime prevalence of NPS with synthetic drugs (such as "Strox and Voodoo") was 1.7%, while for Cannabis, the rate was 66.8%. No dependence on NPS was detected in this study. It was only seen as occasional use. Hashim, Hassan (4) conducted a cross-sectional study on university students in Cairo; here, 38 individuals (6.8%) reported using synthetic cannabinoids ("Strox"), and 3 cases (0.5%) reported smoking Voodoo cigarettes. The percentage of NPS may be higher in the capital, but it's still small compared to the global percentages.

As regards the age of using new psychoactive substances, a study conducted in Cairo among patients presented with acute toxicity. The study revealed that NPS use as Strox and Voodoo is common among males in preparatory schools (10). Another study done in Upper Egypt to evaluate acute and chronic toxicity by synthetic cannabinoids revealed that most users of synthetic cannabinoids were in the adolescent and middle-aged group (11). Our study concluded that these substances are more prevalent in young adults, as the mean age of Strox and Voodoo users is 23.5 years.

Methamphetamine use increased significantly, representing 12.8% of participants compared to Hamdi, Sabry's study (12), as stimulants were representing 1.9%. This may be related to the migration of workers to other Arab countries in which methamphetamine was prevalent, as in Kuwait. More methamphetamine and other amphetamines in powder or pill form are seized in Kuwait than any other new psychoactive substance drugs. (13)

Tropicamide is an antimuscarinic ophthalmic medication used for mydriasis and cycloplegia. It is the first choice in

internal eye examination due to its short effect. According to reports in the literature, only 3 cases of (IV) tropicamide and heroin abuse have been reported, one by Spagnolo, Badiani(14), and two by Bozkurt, Karabulut(15). In this study, it was observed that tropicamide combined with opiates were used in 27 cases (6.39%), 12 of them using tropicamide combined with Heroin (2.8%), and 15 cases using tropicamide combined with Opium (3.5%).

In terms of severity of substance use, Opium, Heroin, and cycloplegics were associated with higher drug severity. Mild to moderate severity was significant in tramadol users.

### 5.0 Limitations:

The main Limitations of our study were: 1) Female patients represent only 1.7% of the participants. 2) As regards new psychoactive substances, there was no available simple test for the detection of substances; it depends on history only.

### 6.0 Conclusion:

The results of this study show that the prevalence of the use of new psychoactive drugs is still lower than the prevalence of the use of controlled drugs among drug users. According to data on new psychoactive substances in Assiut, Strox and Voodoo were recorded in 1.7% of participants, and occasional use only was documented. Tramadol is becoming less common as people replace the drug with more powerful substances such as Heroin and methamphetamine. It is not uncommon to use injectable cycloplegic agents (tropicamide) together with Heroin or opiates.

### Abbreviations:

**NMDA:** N methyl D-aspartate

**EMIT:** Enzyme Multiplied Immunoassay Technique

**UNODC:** United Nations Office on Drugs and Crime

**NPS:** New psychoactive substances

**MSE:** Mental status examination.

**CB:** Cannabinoid

**OCD:** Obsessive-compulsive disorder



**SPSS:** Statistical Package for Social Science  
**ASI:** Addiction Severity Index.

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