



RESEARCH ARTICLE

The use of methamphetamine in the probation population

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ABSTRACT

Objective: Our research aimed to determine the frequency of methamphetamine use among people referred to health institutions for treatment with the probation decision and to reveal the sociodemographic and clinical profile of people who use methamphetamine.

Method: Four hundred and forty-two consecutive cases between 18 and 65 years of age who were referred for treatment to the Probation Outpatient Clinic in Bakirkoy Prof. Mazhar Osman Training and Research Hospital for Psychiatry, Neurology, and Neurosurgery were included in the study. Sociodemographic and clinical information of the cases, substance use and treatment histories, and criminal histories were recorded and evaluated with a semi-structured form. Urine toxicology results, which were taken as one of the obligations of the probation treatment program, were examined.

Results: Substance metabolites were detected in the urine toxicological analysis of 81% of the cases. Methamphetamine use was detected in 24.4% of the sample. It was the second most common illicit substance after cannabis and the fourth common seized. Inhalation was the most common method of methamphetamine use. Of the cases still using methamphetamine, 90.7% (n=98) were found to use at least one substance other than methamphetamine. Emergency admissions for substance-related problems, inpatient addiction treatment, outpatient psychiatric treatment, and forensic histories were significantly higher in the group with methamphetamine use than in the group without methamphetamine use.

Conclusion: Our study is the first to evaluate the rate of methamphetamine use in the probation population and the sociodemographic and clinical profile of people with methamphetamine use. According to the data obtained, one-fourth of the probation population was using methamphetamine. This group represented a more criminally engaged subgroup of substance users with more inpatient addiction treatment and outpatient psychiatric treatment needs with a high rate of polysubstance use. Recognizing the profile of methamphetamine users is essential to develop strategies to meet their treatment needs. In addition, a probation program might provide an opportunity to raise awareness of substance-related medical and social problems and to motivate individuals who are relatively less engaged with treatment to initiate a therapeutic process.

Keywords: Addiction, methamphetamine, probation, substance use

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INTRODUCTION

The probation practice, which has been carried out in Turkey since 2005, is an arrangement that offers the option of not being punished and of being treated to those who are subject to legal sanctions due to the crime of “purchasing, accepting or possessing drugs for use, or using drugs” as defined in Article 191 of the Turkish Penal Code No. 5237 (1). As a result of the verdict of probation, the person is directed to an official health institution where he/she will receive treatment (2).

Cannabis is one of the most commonly used substances in the probation population worldwide (3,4). Compared to western countries, probation practice in Turkey is relatively new (4), and studies on people referred to health institutions for substance use or addiction treatment with probation are relatively few.

There has not been much change in the types of drugs of abuse over the years (5). However, there has been a significant increase in synthetic drugs in Turkey, as such with worldwide, especially in the last 10 years (6,7). Mutlu et al. (5) found that synthetic cannabinoids were as common as cannabis among drugs of abuse in the probation population in 2015. Although the medical consequences of abuse of synthetic cannabinoids are still noteworthy, there appear to be new health problems, in clinical practice, with new synthetic drugs (8).

Methamphetamine use increased in the last few years (9,10), and clinicians began to encounter more frequently adverse psychiatric (11) and medical outcomes (12) brought about by this increase.

According to the European Drug Report 2021, treatment entrants reporting methamphetamine as their primary problem drug are concentrated in Czechia, Germany, Slovakia, and Turkey, accounting for 90% of the methamphetamine clients reported in 2019 (6). Additionally, according to the Turkish Monitoring Centre for Drugs and Drug Addiction (TUBIM), methamphetamine was observed to be the second most used substance after heroin in patients who sought treatment and were hospitalized in 2019 (8). However, in 2015, synthetic cannabinoids after heroin were the drug of choice among the treatment entrants (13). This finding underlines the noticeable change in the substances people with substance use disorders have sought treatment for in the last 5 years.

Located on the Balkan route, Turkey is a key transit and destination country in the trafficking of illicit drugs, such as methamphetamine, the production and trafficking of which continues to increase in recent years as well as for the trafficking of synthetic drugs

produced in Europe and shipped to Asia, and chemicals used in the production of these substances. Record increases were reported in methamphetamine seizures in Turkey in 2021 (8).

As is known, there has been an opioid epidemic in the USA in recent years (14). Especially with the widespread use of opioid-derived prescription drugs, a considerable increase in their use has been observed (15). Although the precautions taken in this regard have contributed positively to some extent, the use of cheaper and more easily accessible illicit opiates (heroin) has increased (16,17). In addition, methamphetamine use appears to be prominent among other substances in those with opioid use disorder (16,17). People who use heroin use methamphetamine, which serves as a cheaper opioid substitute, mostly to mitigate opioid withdrawal and create synergistic highs (16,17). To date, there have been no clinical data reported from Turkey about the frequency of methamphetamine use among people with opioid use disorder. However, it would not be inaccurate to declare that clinicians working in addiction are increasingly encountering methamphetamine use in patients with heroin use disorder who apply for treatment. Polysubstance use is known to facilitate encountering more serious medical problems (18). Therefore, considerable risks of methamphetamine and heroin co-use are non-negligible (16).

Despite the significant increase in the number of those who use methamphetamine in clinical practice and therefore admissions to treatment centers (19,20), there are no data on the frequency of methamphetamine use among people on probation. Adult probationers are a group of interest for several reasons. First, the probation program provides an opportunity to reach out to people who are not particularly seeking treatment and are unaware of the problems due to their substance use (21). Although probation practice is a mandatory legal procedure, it might turn into a therapeutic step and a strong and efficient motivational source to initiate treatment interventions and maintain long-term recovery in individuals who have substance use problems (21). Considering the demonstrated psychosocial barriers to substance use treatment, such as stigma, belief that treatment is unnecessary, and preferring to withdraw alone without assistance (22), the probation program might be the first step toward establishing the therapeutic process outlined above. In addition, probation practices may provide a chance to detect the health problems caused by polysubstance use, which are common in both methamphetamine users (23), and the forensic population (24). Given the

complications that can be potentially serious public health problems (18,25–27), the probation program may provide an additional opportunity to recognize and treat the health problems caused by polysubstance use. Consequently, this study was conducted to determine the frequency of methamphetamine use in the probation population referred to health institutions for treatment and to reveal the sociodemographic and clinical profile of people using methamphetamine.

METHOD

Sample

The study sample consisted of people referred by the Probation Offices in the European side of Istanbul to the Probation Outpatient Clinics in Bakirkoy Prof. Mazhar Osman Training and Research Hospital for Psychiatry, Neurology, and Neurosurgery for treatment in the 3 months between November 2021 and January 2022. Four hundred forty-two cases who agreed to participate and gave written informed consent were included in the study. The Ethics Committee of the Istanbul Bakirkoy Dr. Sadi Konuk Training and Research Hospital approved the present study on November 15, 2021, with a protocol number 2021/553.

Procedure

The probation practice has two stages in outpatient clinics. Individuals referred by the Probation Offices for the first time must apply to primary care probation outpatient clinics in health institutions. They should undergo three urine toxicology analyses every 14 days, in addition to the clinical interviews with a psychiatrist. At the end of this stage, if the person has no substance use or has a substance use disorder in remission, they are directed to the Probation Offices with a report declaring that there is no need to treat. If the person has substance use as confirmed by the urine toxicologic tests and the clinical examinations, they are directed to the 6-week outpatient treatment program during which group-oriented semi-structured psychoeducation practices are applied. However, if the patient requires inpatient treatment or medication-assisted outpatient treatment, they are then referred to an addiction clinic, considered to be the secondary care probation outpatient clinics, such as the Treatment and Training Center for Alcohol and Substance Dependence (AMATEM). All individuals who applied to the probation program in the primary and secondary care outpatient clinics and provided written informed consent for participation were included in the study.

In this cross-sectional and descriptive study, the cases' sociodemographic and clinical information, substance use and treatment histories, and criminal histories were evaluated and recorded with a semi-structured form by a psychiatrist (two of the authors). Along with the information taken from the cases, their medical records were used to confirm treatment histories. In addition, urine toxicology results, which were taken as one of the obligations of the probation treatment program, were examined.

Inclusion criteria:

- Persons referred to the Probation Polyclinic for treatment by the Probation Offices.
- Being between the ages of 18 and 65 years.

Exclusion criteria:

- Being <18 years old and >65 years old.

Materials

1. Sociodemographic and clinical information of the cases, substance use and treatment histories, and criminal histories were evaluated with a semi-structured form prepared by the researchers.
2. Urine toxicological analysis: All cases on probation underwent a structured treatment and a follow-up program for at least 6 weeks. The drug screening test was taken from all cases at each visit under surveillance. Collected urine samples were analyzed with the cloned enzyme donor immunoassay (CEDIA) method on the same day. Drug screening test screened for cannabinoids, synthetic cannabinoids (three types: metabolites JWH-18, JWH-73, and AM-2201), ecstasy, cocaine, benzodiazepine, amphetamine, and opiate metabolites. The results of these urine toxicological analyses were evaluated for the study. As there was no methamphetamine metabolite screened, we considered "amphetamine" positive cases as "methamphetamine" use regarding its high frequency of recent national reports and based on information gathered from individuals.

Statistical Analysis

Statistical analyses were conducted using PASW Statistics for Windows, Version 18.0 software (SPSS, Inc., Chicago, IL, USA). Descriptive statistics (mean, SD, median, minimum, maximum, frequency, and percentage) were calculated. Student's t-test and Mann-Whitney U test were performed to compare continuous variables between groups. Pearson's Chi-squared test was used to compare discrete variables. Statistical significance was set at $p < 0.05$.

RESULTS

The study was conducted in Probation Outpatient Clinic with 442 individuals referred for treatment. Male individuals constituted 97.3% of the sample; 55.9% of the cases were single, and 63.6% were regularly working (Table 1). The mean age of the sample was 32.56 ± 8.13 years. The mean period of education of the sample was 8.09 ± 2.94 years.

Of the sample, 21.7% were found to have received inpatient addiction treatment. The mean number of hospitalizations of the group with a history of inpatient addiction treatment was 2.24 ± 1.96 . Heroin, synthetic cannabinoids, and methamphetamine were the most commonly used substances among the patients who had received inpatient addiction treatment. The rate of inpatient treatment due to other medical problems caused by substance use, other than addiction treatment, was 10%. Of all inpatient treatment, other than addiction treatment, 93% constituted admissions to acute psychiatry inpatient clinics. Of the cases, 12.9% were still under outpatient treatment. Cases with a family history of substance use constituted 9% of the sample (Table 1).

The most common substances reported to be seized were cannabis (52%), heroin (17.2%), and synthetic cannabinoids (16.3%). These substances were followed by methamphetamine (10.4%), ecstasy (4.1%), cocaine (3.6%), and other substances (Captagon and thinner) (0.7%) (Table 2).

The substances currently used by the cases were considered positive results for the substances in drug toxicology screens and the substances they mentioned that they were currently using. The most common illicit substances were cannabis (44.8%), methamphetamine (24.4%), and synthetic cannabinoids (18.8%). Of the cases, 34.2% were using alcohol. Drug toxicology screens were negative in 19% of the sample (Table 2).

The most common way of drug seizures was the routine police control in the streets, with 58.6%. It was determined that the rate of those who had a probation file at least once before was 66.7%. The mean number of prior probation files was 1.7 ± 3.09 . Additionally, 26.9% of them were imprisoned because of their prior files. The rate of imprisonment at least once was 44.3% in the sample. Of all cases, 34.4% were imprisoned for a substance-related crime (Table 3).

Of the sample, 24.4% ($n=108$) consisted of people still using methamphetamine. Of this group, 96.2%

($n=104$) used methamphetamine by inhalation, 2.8% ($n=3$) intravenously, 1.9% ($n=2$) as a liquid. Of the cases, 4.6% ($n=5$) were using methamphetamine with more than one method.

The most common substances that were seized in persons who were still using methamphetamine were methamphetamine with 27.8% ($n=30$), cannabis with 26.9% ($n=29$), heroin with 26.9% ($n=29$), synthetic cannabinoids with 18.5% ($n=20$), ecstasy with 3.7% ($n=4$), cocaine with 2.8% ($n=3$), and other substances with 1.9% ($n=2$).

Of the cases still using methamphetamine, 90.7% were found to use at least one substance other than methamphetamine. The most frequently used illicit substances by the individuals still using methamphetamine were cannabis with 46.3% ($n=50$), heroin with 37.0% ($n=40$), synthetic cannabinoids with 34.3% ($n=37$), ecstasy with 23.1% ($n=25$), cocaine with 16.7% ($n=18$), and volatile substances with 0.9% ($n=1$). Alcohol use was also detected in 34.3% ($n=37$) of the cases.

A significant difference was found for forensic and treatment history between the cases with and without methamphetamine use. The history of prior probation and imprisonment was higher in cases with methamphetamine use than in cases without methamphetamine use. The cases with methamphetamine use were significantly more hospitalized for addiction and had a significantly higher number of prior probation files than those without methamphetamine use. The rate of history of admissions to an emergency room, hospitalization for addiction, and being on a current outpatient treatment were significantly higher in cases with methamphetamine use than in cases without methamphetamine use (Table 4).

Of the cases with heroin use ($n=77$), 51.9% were co-using methamphetamine. Of those who had an inpatient addiction treatment for opioid (heroin) use disorder, 11.1% were found to be co-using heroin and methamphetamine before hospitalization.

Table 5 compares clinical characteristics and forensic history between heroin users with and without methamphetamine use. No statistically significant difference was found between the two groups (Table 5).

DISCUSSION

To our knowledge, this is the first study to determine the rate of methamphetamine use in the probation population. Of the individuals referred to medical

Table 1: Sociodemographic and clinical characteristics of the sample (n=442)

	Min	Max	Mean	SD
Age (years)	18	65	32.56	8.13
Years of education	0	18	8.09	2.94
	n		%	
Gender				
Female	12		2.7	
Male	430		97.3	
Marital status				
Single	247		55.9	
Married	147		33.3	
Widowed/divorced	48		10.9	
Current employment				
Stable working	281		63.6	
Irregular/part-time	43		9.7	
Not working	118		26.7	
	Min	Max	Mean	SD
Total number of hospitalizations for addiction (and in the group with a history of inpatient addiction treatment)	0 (1)	9 (9)	0.49 (2.24)	1.30 (1.96)
	n		%	
History of hospitalization for addiction				
No	346		78.3	
Yes	96		21.7	
Hospitalizations for addiction (drugs of choice)				
Cannabis	10		10.4	
Synthetic cannabinoids	18		18.8	
Methamphetamine	13		13.5	
Cocaine	3		3.1	
Heroin	72		75.0	
Ecstasy	2		2.1	
Volatile substances	4		4.2	
Alcohol	2		2.1	
Multiple substances	20		20.8	
History of hospitalizations except for addiction				
No	398		90.0	
Psychiatry	41		9.3	
Other than psychiatry	3		0.7	
Hospitalizations except for addiction (drugs of choice)				
Cannabis	14		31.8	
Synthetic cannabinoids	19		43.2	
Methamphetamine	11		25.0	
Cocaine	3		6.8	
Heroin	9		20.5	
Ecstasy	2		4.5	
Volatile substances	2		4.5	
Alcohol	3		6.8	

Table 1 (cont.): Sociodemographic and clinical characteristics of the sample (n=442)

	n	%
Multiple substances	16	36.4
Admissions to emergency room		
No	409	92.5
Yes	33	7.5
Current outpatient treatment		
No	385	87.1
Yes	57	12.9
Family history of substance use		
No	402	91.0
Yes	40	9.0

SD: Standard deviation; Min: Minimum; Max: Maximum.

Table 2: Substances that were seized and that were currently used by the cases (n=442)

	Substances seized		Substances used	
	n	%	n	%
Cannabis	230	52	198	44.8
Synthetic cannabinoids	72	16.3	83	18.8
Methamphetamine	46	10.4	108	24.4
Cocaine	16	3.6	48	10.9
Heroin	76	17.2	77	17.4
Ecstasy	18	4.1	34	7.7
Other substances	3	0.7	3	0.7
Alcohol	–	–	151	34.2
Multiple substances	17	3.8	205	46.3
No substance	–	–	84	19.0

institutions for treatment within the scope of probation, 24.4% were found to use methamphetamine. It was the second most common illicit substance that people on probation use and the fourth common seized. Individuals using methamphetamine constituted 33.4% (n=323) of the cases among whom nonalcoholic substance metabolites were detected.

Methamphetamine was seized in 2009 for the first time in Turkey. By 2019, it was on the streets of all 81 provinces. As is known, there is a global increase in the production and trafficking of methamphetamine. In parallel with this, there has been an increase in seizures every year. By 2021, the most significant increases were seen for methylenedioxymethamphetamine and methamphetamine in Europe. It has been reported that the number of methamphetamine seizures in Turkey increased fourfold compared to the previous year in 2020 (8).

Table 3: Forensic history of the sample (n=442)

	Min	Max	Mean	SD
Number of prior probation files	0	43	1.7	3.09
	n	%		
Probation penalty status				
None	296	67.2		
Imprisonment	119	26.9		
Fine	36	8.1		
Other	5	1.1		
Multiple	15	3.4		
History of imprisonment				
None	246	55.7		
Substance-related crime	152	34.4		
Theft/extortion/looting	55	12.4		
Wounding/murder	23	5.2		
Other crimes	30	6.8		
Multiple crimes	55	12.4		

SD: Standard deviation; Min: Minimum; Max: Maximum.

In illicit drug markets, methamphetamine is available in powder, crystal, and tablet forms. In Europe and Turkey, it is mostly available in crystal form (8). In this study, we did not specifically note the forms of methamphetamine that individuals consumed. However, we examined the consumption methods and found that the most common method was inhalation. Only 2.8% declared using intravenously, and all these individuals were co-using IV heroin.

It is well known that there has been a significant increase in methamphetamine-related health issues in emergency admissions in recent years (10,19,20). In a recent meta-analysis, methamphetamine-related presentations in emergency departments have been

Table 4: Sociodemographic and clinical characteristics of the cases with and without methamphetamine use (n=442)

	With methamphetamine use (n=108)		Without methamphetamine use (n=334)		t/Z	p
	Mean±SD		Mean±SD			
Age ^a (years)	33.25±7.54		32.33±8.31		-1.020	0.308
Years of education ^a	8.26±2.40		8.03±3.09		-0.695	0.487
Number of prior probation files ^b	2.54±4.69		1.43±2.29		-3.822	<0.01**
Total number of hospitalizations for addiction ^b	0.86±1.79		0.37±1.07		-4.144	<0.01**
	n	%	n	%	χ ²	p
Gender ^c						
Female	6	50.0	6	50.0	4.366	0.037*
Male	102	23.7	328	76.3		
Marital status ^c						
Single	63	25.5	184	74.5	0.522	0.770
Married	35	23.8	112	76.2		
Widowed/divorced	10	20.8	38	79.2		
Current employment ^c						
Stable working	61	21.7	220	78.3	4.225	0.121
Irregular/part-time	10	23.3	33	76.7		
Not working	37	31.4	81	68.6		
Prior probation files ^c						
No	26	17.7	121	82.3	5.431	0.020*
Yes	82	27.8	213	72.2		
History of imprisonment ^c						
No	35	14.2	211	85.8	31.300	<0.01**
Yes	73	37.2	123	62.8		
Admissions to emergency room ^c						
No	92	22.5	317	77.5	11.172	<0.01**
Yes	16	48.5	17	51.5		
History of hospitalization for addiction ^c						
No	69	19.9	277	80.1	17.411	<0.01**
Yes	39	40.6	57	59.4		
History of hospitalizations except for addiction ^c						
No	92	23.1	306	76.9	3.766	0.052
Yes	16	36.4	28	63.6		
Current outpatient treatment ^c						
No	83	21.6	302	78.4	13.373	<0.01**
Yes	25	43.9	32	56.1		
Family history of substance use ^c						
No	95	23.6	307	76.4	1.550	0.213
Yes	13	32.5	27	67.5		

*: P<0.05; **: P<0.01; a: Student's t-test; b: The Mann-Whitney U test; c: Pearson's Chi-squared test.

Table 5: Clinical and forensic characteristics of the cases with heroin use according to their methamphetamine use (n=77)

	With methamphetamine use (n=40)		Without methamphetamine use (n=37)		χ^2	p
	n	%	n	%		
Prior probation files ^a						
No	12	46.2	14	53.8	0.528	0.467
Yes	28	54.9	23	45.1		
History of imprisonment ^a						
No	16	45.7	19	54.3	0.999	0.318
Yes	24	57.1	18	42.9		
Admissions to emergency room ^a						
No	32	48.5	34	51.5	2.220	0.136
Yes	8	72.7	3	27.3		
History of hospitalization for addiction ^a						
No	14	53.8	12	46.2	0.057	0.812
Yes	26	51.0	25	49.0		
History of hospitalizations except for addiction ^a						
No	35	51.5	33	48.5	0.053	0.818
Yes	5	55.6	4	44.4		
Current outpatient treatment ^a						
No	26	48.1	28	51.9	1.046	0.306
Yes	14	60.9	9	39.1		
Family history of substance use ^a						
No	36	54.5	30	45.5	1.249	0.264
Yes	4	36.4	7	63.6		

a: Pearson's Chi-squared test.

shown to be characterized by cardiac complications, psychiatric symptoms, and aggression (28). The results of our study for the cases with methamphetamine use seem to represent a more criminally engaged subgroup of substance users with more inpatient addiction treatment and outpatient psychiatric treatment needs.

This present study found that emergency admissions were statistically higher in patients with methamphetamine use than in those without methamphetamine use. The clinical data have demonstrated that there has been a substantial increase in methamphetamine-related deaths in the recent past, compared to previous years (26,27,29). In 2021, this increase was reported to be approximately threefold compared to 2018 in Turkey (8). The reasons for this situation might be the high addictive potential with the risk of overdose (30), systemic side effects related to methamphetamine itself (28), and the additional negative consequences of polysubstance use (8,18,25–27).

Individuals who use methamphetamine have frequently been suggested to engage with other substances (18,26,31). In our study, 90.7% of the individuals with methamphetamine use were found to use at least one more illicit substance other than methamphetamine. This finding is critical considering the poorer medical and mental health problems and poorer substance use outcomes associated with polysubstance use (18).

Methamphetamine is one of the synthetic substances frequently associated with psychiatric symptoms (20,32), as with synthetic cannabinoids, one of the most important health problems of recent years (33). The most common symptoms in emergency admissions associated with methamphetamine have been reported to be neuropsychiatric symptoms, such as agitation, anxiety, hallucinations, and psychosis (19). The methamphetamine-associated psychotic disorder is one of the reasons for psychiatric emergency admission (28,34), and inpatient treatment is often required (34). We did not find a significant difference

between patients with methamphetamine use and those without methamphetamine use in terms of hospitalizations caused by substance-induced problems. However, outpatient treatment for substance-related psychiatric symptoms was more common in the group with methamphetamine use than in the group without methamphetamine use. Nevertheless, there has not been any specific medication for the treatment of methamphetamine use disorder approved by the FDA yet (35).

The clinical data suggest that there has been a substantial increase in concomitant opioid and methamphetamine use (17,25,31), and mainly these two substances have led to a twin epidemic in the United States (16,31). Addiction specialists have begun to encounter increasing methamphetamine use in patients with opioid use disorder and the complicated clinical features, such as treatment nonadherence (36), injecting substance use (23), and associated risks such as viral hepatitis (37).

To our knowledge, this is the first study to demonstrate the frequency and characteristics of the co-use of methamphetamine and heroin in Turkey. Among the polysubstance users in individuals with methamphetamine use, heroin was the second most frequently used substance after cannabis. In addition, 51.9% of the individuals with heroin use disorder were found to use methamphetamine. We did not find any statistically significant difference in patients with heroin use disorder, with and without methamphetamine use. Only 2.8% of individuals with methamphetamine use were declared using intravenously. Although the consumption methods of all substances were not in the scope of this study, all participants with methamphetamine use were asked how they used to take this particular substance. Considering the harms of concomitant use of methamphetamine and heroin in risky populations, such as people with injecting drug use and people with risky sexual behaviors (38,39), we think that IV methamphetamine users also being IV heroin users should be underlined. There has been much effort, such as harm reduction methods, to control the increasing incidence of viral hepatitis (HCV, HBV) and HIV infections among people who inject drugs (40,41). However, clinicians are still dealing with the negative consequences of risky behaviors in the substance-using population (38,39). Polysubstance use (18) and risky drug use behaviors (23,37) can be considered a more severe addictive profile; therefore, they might be reasons for preferring inpatient

treatment rather than outpatient treatment. However, methamphetamine use accompanied only 11.1% of inpatients with heroin use disorder although half of the cases with heroin use disorder used methamphetamine.

The results of our study emphasize the need for increased attention to the concomitant use of methamphetamine and heroin, as its rate was found remarkably high, which is in accordance with the international data (17). These results need to be interpreted with caution, as the probation population is considered a lesser treatment-engaged group than the treatment-seeking group among substance users (21). Accordingly, despite the health problems possibly related to methamphetamine use, a group of methamphetamine users either do not seek treatment or are not appropriately guided within the healthcare system after applying to health institutions, thus losing their chance for treatment (27). In particular, it has been shown that even individuals who were well connected to substance use treatment for their opioid use were still likely to be undertreated for their methamphetamine use (27). From this perspective, the probation program might have a therapeutic function in including at-risk people in the treatment process. In this regard, recognizing the profile of methamphetamine users seems essential in developing strategies to meet their treatment needs.

Despite the different clinical characteristics, we did not find a significant difference in sociodemographic characteristics between the group with methamphetamine use and those without methamphetamine use. Of our sample, 2.7% were females. The number of female cases was not statistically sufficient to capture significant differences between both genders. However, despite the small number of female individuals in this study (n=12), the frequency of methamphetamine use in female cases caught our attention. Clinical studies with more participants are needed to evaluate the frequency of methamphetamine use and gender differences in clinical characteristics in female patients.

This study has some limitations. First, we mainly used the self-reported personal data, laboratory data, and available medical records restricted to the hospital where the study was conducted. Therefore, some information provided by the individuals may have been inaccurate or inadequate. No clinical scale was applied. The male–female ratio created a difficulty to make statistically favorable comparisons between gender-specific characteristics.

CONCLUSION

The present study is the first to evaluate the rate of methamphetamine use in the probation population. It was the second most common illicit substance among people on probation, and approximately one-fourth of the individuals were using methamphetamine, primarily by inhalation. According to the results of our study, methamphetamine, among the new synthetic substances that constitute one of the most important health problems of recent years, seems to have surpassed the rate of synthetic cannabinoids, which have been widely used in Turkey in the recent past. Considering that polysubstance use and associated problems were prevalent among methamphetamine users, clinicians should be familiar with the medical consequences, along with the most common psychiatric symptoms accompanying methamphetamine use. Therefore, recognizing the profile of methamphetamine users is essential to develop strategies to meet their treatment needs. Despite being mandatory rather than voluntary, the probation program might motivate individuals who are relatively less engaged with treatment to initiate a treatment process. In this regard, the probation program might be the first step toward establishing the therapeutic process.

Contribution Categories		Author Initials
Category 1	Concept/Design	I.A.
	Data acquisition	I.A., B.A.C.
	Data analysis/Interpretation	I.A., S.U.
Category 2	Drafting manuscript	I.A., S.U.
	Critical revision of manuscript	I.A., S.U.
Category 3	Final approval and accountability	I.A., S.U., B.A.C.

Ethical Approval: The Bakirkoy Dr. Sadi Konuk Training and Research Hospital Ethics Committee granted approval for this study (date: 15.11.2021, number: 2021/553).

Informed Consent: Informed consent was obtained from all participants.

Peer-review: Externally peer-reviewed.

Conflict of Interest: The authors declare that they have no conflict of interest.

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