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Illicit Drug Use Patterns among Hospitalized Patients after the COVID-19 Pandemic and Economic Crisis

COVID-19 Pandemisi ve Ekonomik Kriz Sonrasında Hastanede Yatan Hastalarda Madde Kullanım Örüntüleri

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Abstract

Objective: This study aimed to investigate the impact of the COVID-19 pandemic and subsequent economic crisis on illicit drug use patterns in Türkiye.
Method: The study population comprised 1027 patients diagnosed with substance use disorder (SUD). 615 patients who were hospitalized between May 2018-December 2019 and 412 patients who were hospitalized between December 2021-August 2023 at the Alcohol-Drug Addiction Research, Treatment and Training Center in Elazığ Mental Health and Diseases Hospital were recruited to study.
Results: The rate of opioid-positive results was significantly higher in the May 2018-December 2019 group. The rate of methamphetamine-positive results was significantly higher in the December 2021 - August 2023 group. The rate of cannabis-positive results was found to be similar between the two groups. The treatment completion rate was significantly lower in methamphetamine-positive patients when compared with methamphetamine-negative patients. The treatment completion rate was significantly higher in opioid-positive patients when compared with opioid-negative patients.
Discussion: While methamphetamine consumption has significantly increased, opioid consumption has significantly decreased in the wake of the economic crisis in Türkiye and the COVID-19 pandemic. Monitoring changes in illicit drug use patterns could help take appropriate measures.

Keywords: Illicit drug use, methamphetamine, COVID-19, economic crisis

Öz

Amaç: Bu çalışma COVID-19 salgınının ve ardından gelen ekonomik krizin Türkiye'deki yasa dışı madde kullanım paternleri üzerindeki etkisini araştırmayı amaçlanmıştır.
Yöntem: DSM-5 kriterlerine göre madde kullanım bozukluğu tanısı alan 1027 hasta çalışmaya dahil edildi. Elazığ Ruh Sağlığı ve Hastalıkları Hastanesi Alkol ve Madde Bağımlılığı Tedavi Eğitim Merkezi'nde Mayıs 2018 - Aralık 2019 tarihleri arasında yatan 615 hasta ve Aralık 2021 - Ağustos 2023 tarihleri arasında yatan 412 hasta çalışmaya alındı.
Bulgular: Ürinaliz testinde pozitif opioid sonuçlarının oranı Mayıs 2018 - Aralık 2019 grubunda anlamlı derecede yüksekti. Ürinaliz testinde pozitif metamfetamin sonuçlarının oranı Aralık 2021 - Ağustos 2023 grubunda anlamlı derecede yüksekti. Pozitif esrar sonuçlarının oranı iki zaman aralığında benzer bulundu. Metamfetamin kullanan hastalarda tedaviyi tamamlama oranı metamfetamin kullanmayan hastalara göre anlamlı derecede düşük bulundu. Opioid kullanan hastalarda tedaviyi tamamlama oranı, opioid kullanmayan hastalara göre anlamlı derecede yüksekti.
Tartışma: Çalışmamız, Türkiye'de yaşanan ekonomik kriz ve COVID-19 salgını sonrasında hastanede yatan hastalarda metamfetamin tüketim oranının anlamlı düzeyde arttığını, opioid tüketiminin ise anlamlı düzeyde azaldığını göstermektedir. Yasa dışı madde kullanım patternlerindeki değişimlerin izlenmesi ve ilişkili faktörlerin takip edilmesi uygun tedbirlerin alınması ve tedavi yaklaşımlarının geliştirilmesine yardımcı olacaktır.

Anahtar kelimeler: Yasa dışı madde kullanımı, metamfetamin, COVID-19, ekonomik kriz

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Introduction

Substance use disorder (SUD) causes devastating effects on the physical and psychological well-being of individuals (1). It also impact the social functioning of individuals and create a burden on society (2). Therefore, SUD is one of the most important public health problem worldwide. The number of prevalence studies of SUD are quite limited in Türkiye. A study, which was conducted in 2009 involving 1720 students, reported 6.4% having used an illicit drug at least once during their lifetime (3). Another study involving 8045 individuals, which was conducted in 2012, reported 2.8% having used an illicit drug at least once during their lifetime (4). Turkish Monitoring Center for Drugs and Drug Addiction reported 3.1% lifetime prevalence of illicit drug use in 2018 (5). In another study which conducted in 2018, lifetime prevalence of single substance use and polysubstance use were found 4.5 and 2.6%, respectively (6). According to the Turkish Monitoring Center for Drugs and Drug Addiction reports, the number of outpatient and inpatient applications for SUD treatment in 2022 has increased when compared with previous years (7, 8). Also, 37.4% of patients were treated for heroin (55.1% in 2019), 37.8% were treated for methamphetamine (15.3% in 2019), 7% were treated for cannabis (11.7% in 2019). In Türkiye, the number of inpatient treatment centers had increased to 59 by the end of 2022, when compared with 33 centers in 2015 (7).

The COVID-19 pandemic has caused mass unemployment, disruptions in global trade, and a severe economic downturn (9, 10). Government-imposed restrictions during the COVID-19 pandemic affected all aspects of illegal drug markets, from drug production and trafficking to consumption (11). Drug usage patterns have been drastically altered during the pandemic due to disruptions in drug trafficking, the economic downturn, confinement measures, and difficulties in obtaining precursors (12). A general decline in the perceived purity and availability of drugs, along with increased prices, was reported during the COVID-19 pandemic (13). Throughout the pandemic, a reduction in the availability of precursors for methamphetamine has led to a decrease in methamphetamine production (14). Even though the COVID-19 pandemic is over, the socioeconomic effects of the pandemic are still ongoing. The COVID-19 pandemic has taken a heavy toll on the global economy, especially economically fragile countries (15).

Economic crises significantly change drug use patterns. Research-based on national statistical health data showed that problematic drug use increased by 11.6 percent between 2008 and 2010 in Greece, which was attributed to the economic crisis in Greece (16). Colell et al. conducted a study in Spain and found that problematic substance use was significantly higher in unemployed men and women when compared to employed persons (17). A deteriorated socioeconomic situation can lead to an increase in substance use and related social disruptions. Studies that examined the effects of the economic crisis on drug use patterns showed that the 2008 global crisis resulted in a shift from more expensive to cheaper illicit drugs (18). A wastewater analysis study conducted in Northern Italy between 2005 and 2009 revealed a significant reduction in the consumption of heroin and cocaine in 2009, while methamphetamine consumption was found to have significantly risen from 2005 to 2008 and rose further in 2009(19).

The economic crisis in Türkiye, exacerbated by the economic fallout from the COVID-19 pandemic and specific local conditions, has resulted in severe inflation and a significant decrease in purchasing power in recent years (20). Considering previous research on the impact of economic crises on changes in illicit drug use patterns, the economic crisis may be affecting illicit drug use patterns in Türkiye. According to the Turkish Monitoring Center for Drugs and Drug Addiction 2023 report, there has been a significant decrease in the amount of seized heroin in 2022 when compared with the prior year. The quantity of seized cannabis has shown a slight increase. Most strikingly, the seized methamphetamine amount has been threefold in 2022 when compared with the prior year and reached 16210 kilograms. Crystal methamphetamine is the most seizure form of methamphetamine in Türkiye, and users generally declare smoking as the most popular administration route (7, 21). The report also revealed that in 2022, 56.9 percent of the 240 deaths related to substance use in Türkiye were attributed to methamphetamine (7).

Despite the well-known impact of significant events on illicit drug use patterns, we could find no study in the literature exploring the impact of the economic crisis on illicit drug use patterns in Türkiye. The assessment

of the significance of monitoring shifts in patterns of illicit drug use is imperative for the implementation of suitable measures and the promotion of novel approaches to mitigating harm associated with drug use. We hypothesize that changing socioeconomic and global situations may have an impact on the illicit drug use patterns in Türkiye. The purpose of this study was to examine the impact of the COVID-19 pandemic and subsequent economic crisis on illicit drug use patterns in our treatment center.

Method

Setting and Sample

This retrospective cross-sectional study included patients who were hospitalized with a diagnosis of SUD for two time periods of 20 months (May 2018-December 2019 and December 2021-August 2023) at the Alcohol-Drug Addiction Research, Treatment and Training Center in Elazığ Mental Health and Diseases Hospital. Sociodemographic and laboratory data of the patients were obtained from patient files and an electronic database system. The study included only inpatients who were hospitalized voluntarily. Preliminarily, data from 1107 patients, who were hospitalized with the diagnosis of SUD, were screened. There were 14 patients excluded who had no urinalysis test result. 44 patients, who were repetitively hospitalized within 3 months and had two urinalysis results, were included with their first urinalysis results. 22 patients, who had concomitant serious mental illness such as bipolar disorder or psychosis, were excluded.

The treatment center is equipped with 24 inpatient beds. The treatment center accepted patient admissions from 18 provinces (Elazığ, Erzurum, Erzincan, Kars, Ağrı, Tunceli, Malatya, Van, Diyarbakır, Mardin, Muş, Bingöl, Bitlis, Siirt, Hakkari, Şırnak, Batman, Ardahan). The planned inpatient treatment duration is 21 days in our treatment center. The average annual inpatient in our treatment center was 426 between 2018-2022. According to the routine clinical practice in our treatment center, detailed clinical and sociodemographic information about patients is collected from patients and their immediate circle. The clinical diagnosis of SUD is made by experienced psychiatrists through clinical interviews following the Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition (DSM-5) criteria (22). Urinalysis tests are routinely performed on the first day of hospitalization. All the participants were male because there is no inpatient clinic for female patients in our treatment center. Due to the limited number of patients with comorbid serious mental illnes (n=22) who were hospitalized in the Alcohol-Drug Addiction Research, Treatment and Training Center, we excluded patients with bipolar disorder and psychosis. We did not exclude patients with comorbid psychiatric disorders other than serious mental illnesses. We excluded the years 2020 and 2021 due to the disruption of healthcare services caused by the 2020 Elazığ earthquake and the COVID-19 restrictions in Türkiye. Additionally, we excluded data from February 2023 due to the disruption of healthcare services in our clinic because of the 2023 Kahramanmaraş earthquakes. The Firat University ethics committee approved this study (Date: 27/09/2023, Number: 2023/ 13-49).

Laboratory Analysis

In accordance with the standard hospital protocol, urinalysis is conducted within the initial 24 hours of hospitalization. The urine drug screen was conducted at the Clinical Biochemistry Laboratory using a Beckman Coulter AU480 instrument (CA, USA). At least 30 mL of urine samples were collected in compliance with the audit chain application. The enzyme multiplied immunoassay technique (EMIT II Plus, Syva, Siemens) was used for the urine drug screening. A total of six types of psychoactive substances (which contain the most common drugs in Türkiye) were investigated in the urine: amphetamine (methamphetamine), cocaine, opioid, tetrahydrocannabinol (THC), benzodiazepines, and buprenorphine.

Statistical Analysis

All statistical analyses were conducted with IBM Statistical Package for the Social Sciences (SPSS) for Windows, version 21.0. As suggested by George and Mallery (23) data are accepted to have normal

distribution if the skewness and kurtosis values are between -2 and +2. For normally distributed data, the independent sample t-test was used to compare groups; otherwise, the Mann–Whitney U test was used. The Chi-square test was used to compare the categorical variables within groups. All p-values less than 0.05 were considered statistically significant.

Results

The study population comprised 1027 patients diagnosed with SUD. 615 patients who were hospitalized between May 2018 - December 2019 and 412 patients who were hospitalized between December 2021 - August 2023 (February 2023 excluded due to interrupted healthcare service) were assessed. There was no significant difference between the two groups in terms of age. The rate of patients who live in urban areas was significantly higher in the May 2018-December 2019 group. The rate of the patients who completed treatment (21 days) was significantly higher in the May 2018-December 2019 group. The average annual inflation rate between May 2018–December 2019 was 17.05 percent ± 4.74 percent. The average inflation rate between December 2021–August 2023 was 61.82 percent ± 16.7 percent (24) (Table 1).

Table 1. Sociodemographic and clinical characteristics of the participants and comparison of the annual inflation rate between two timelines

Variable	May 2018 –December 2019 (n=615)	December 2021 –August 2023 * (n=412)	p
Age	30.86±6.39	30.06±7.08	0.065
Completion of treatment (21 days)	232 (37.7%)	109 (26.5%)	**<0.001**
Living condition			**0.002**
Rural	213 (34.6%)	183 (44.4%)	
Urban	402 (65.4%)	229 (55.6%)	
Annual inflation rate (%)	17.05%±4.74	61.82±16.7	**<0.001**

*2023 February was excluded due to the temporary cessation of the healthcare service

Table 2. Comparison of the illicit drug use pattern between groups

	May 2018 - December 2019 (n=615)	December 2021 –August 2023* (n=412)	p
Opioid (n, %)	255 (41.5%)	51 (12.4%)	<0.001
Methamphetamine (n, %)	48 (7.8%)	164 (39.8%)	<0.001
Cannabis (n, %)	69 (11.2%)	44 (10.7%)	0.786
Methamphetamine + Cannabis (n, %)	62 (10.1%)	83 (20.1%)	<0.001
Methamphetamine + Opioid (n, %)	88 (14.3%)	37 (9 %)	0.011
Cannabis + Opioid (n, %)	47 (7.6)	2 (.5%)	<0.001
Methamphetamine+ Cannabis +Opioid (n, %)	25 (4.1%)	6 (1.5%)	0.017
Negative (n, %)	11 (1.8%)	21 (5.1%)	0.003
Cocaine (n, %)	8(1.3%)	4 (1%)	0.630

n: number; *2023 February was excluded due to the temporary cessation of the healthcare service

The rate of opioid, methamphetamine+opioid, methamphetamine+cannabis+opioid, and cannabis+opioid use was significantly higher in the May 2018 - December 2019 group. The rate of methamphetamine, methamphetamine+cannabis, and methamphetamine+opioid use was significantly higher in the December

2021-August 2023 group. The rate of the negative results in the urinalysis test was significantly higher in the December 2021-August 2023 group (Table 2).

Table 3. Comparison of the rate of the use of illicit drugs between groups

	May 2018 - December 2019 (n=615)	December 2021 –August 2023* (n=412)	p
Opioid positive (n, %)	415 (67.4%)	96 (23.3%)	**<0.001**
Methamphetamine positive (n, %)	223 (36.3%)	290 (70.4%)	**<0.001**
Cannabis positive (n, %)	203 (33.0%)	135 (32.8%)	0.714
Polysubstance use (n, %)	222 (36.1%)	128 (34.1%)	0.096

n: number

The rate of opioid-positive results was significantly higher in the May 2018-December 2019 group. The rate of methamphetamine-positive results was significantly higher in the December 2021 - August 2023 group. The rate of the cannabis-positive results was found to be similar between the two groups. The rate of the polysubstance use results was similar between the two groups (Table 3).

Table 4. Association of the treatment completion rate with used illicit drug

n(%)	MA positive	MA negative	Opioid positive	Opioid negative	Cannabis positive	Cannabis negative	PSU	MSU
Completed treatment	117 (22.8%)	224 (43.5%)	233 (45.5%)	108 (20.9%)	100 (29.5%)	241 (35%)	105 (30%)	236 (35.3%)
Not completed	396 (77.2%)	290 (56.5%)	278 (54.5%)	408 (79.1%)	238 (70.5%)	448 (65%)	245 (70%)	441 (64.7%)
p value	<0.001		<0.001		0.085		0.117	

n: number; MA: Methamphetamine; PSU: Polysubstance use; MSU: Monosubstance use

The treatment completion rate was significantly lower in patients with methamphetamine-positive patients when compared with methamphetamine-negative patients (p<0.001). The treatment completion rate was significantly higher in patients with opioid-positive patients when compared with opioid-negative patients (p<0.001). The treatment completion rate was found to be similar in patients with cannabis-positive patients when compared with cannabis-negative patients (p=0.085). The treatment completion rate was similar in patients with polysubstance use when compared with monosubstance use patients (p=0.117) (Table 4).

Discussion

The present study showed that while methamphetamine use significantly increased, opioid use significantly decreased among hospitalized patients in the wake of the economic crisis in Türkiye and the COVID-19 pandemic. Significant events such as economic crises, pandemics, and natural disasters may lead to major disruptions in social, economic, and physical environments, which can influence patterns of illicit drug use (25). Pavarin et al. showed a decrease in heroin and cocaine use, while there was an increase in the use of amphetamine-type stimulants in northern Italy from 2009 to 2012 (26). A similar shift in illicit drug use patterns (from heroin to amphetamine) was observed in Hungary between 2010 and 2012 (27). Studies investigating the impact of the 2008 global economic crisis on illicit drug use patterns also show a shift from expensive to cheaper illicit drugs (18, 19). A study suggest that some individuals who use heroin and methamphetamine describe methamphetamine as an relatively inexpensive alternative (28). Economic downturns can potentially influence illicit drug use patterns through various mechanisms, including changes in individual and community stress levels, access to substances, and drug market dynamics. In times of crisis, people tend to choose cheaper and more readily available drugs as the cost of living rises and purchasing power decreases. Türkiye has been through an economic crisis, which led to severe inflation and a significant decline in purchasing power in recent years (20). Türkiye has been through severe inflation in

recent years, and its annual inflation rate peaked in October 2022 at 85.51 percent. The average annual inflation rate was significantly higher between December 2021 and August 2023 when compared with between May 2018 and December 2019 (29). The methamphetamine use rate was significantly higher, and the opioid use rate was significantly lower between December 2021 and August 2023 when compared with between May 2018 and December 2019. Our results were consistent with previous reports and showed a shift in drug use patterns toward cheaper drugs such as methamphetamine.

Besides the economic situation, several variables, such as the current situation in trade routes, the global political situation, and institutional decisions on drugs, may have an effect on illicit drug use patterns. Since ephedrine can easily be used in the production of methamphetamine, production has increased significantly in South Asia due to the discovery of Ephedra sinica, a shrub that naturally contains ephedrine (30). According to United Nations Office on Drugs and Crime, methamphetamine trafficking in South Asia is surging, nearly twelvefold increase in seizures of the drug from 2.5 tons in 2017 to 29.7 tons in 2021 (31). Striking political and socioeconomic changes in illicit drug hubs may have an impact on the illicit drug use patterns in Türkiye. Also, being a transit destination in illicit drug trafficking, Türkiye becomes more vulnerable to these changes. Turkish Monitoring Center for Drugs and Drug Addiction reported that the seized methamphetamine amount has been threefold in 2022 when compared with the prior year (7). In concert with these reports, our single-center study showed an increasing trend in methamphetamine use in recent years.

In our treatment center, the recommended minimum duration of hospitalization is 21 days. Using cannabis and polysubstance use had no significant effect on treatment completion. The treatment completion rate was significantly higher in patients with methamphetamine-negative results and opioid-positive results. It may be attributed to that there is no widely accepted pharmacological substitution treatment specifically approved for methamphetamine dependence, while there are specific detoxification and maintenance treatments for opioid use disorder (OUD). In 2002, the Food and Drug Administration (FDA) approved buprenorphine maintenance treatment (BMT) for managing Opioid Use Disorder (OUD) (32). Buprenorphine and buprenorphine/naloxone tablets for sublingual administration were shown to be effective in OUD (33). In 2010, sublingual buprenorphine/naloxone was approved for opioid use disorder as a detoxification or maintenance treatment by the Turkish Ministry of Health (34). There is no FDA-approved medication for the treatment of methamphetamine use disorder (35). The absence of substitution treatment may cause patients to struggle with more severe withdrawal symptoms, even in inpatient clinics. Methamphetamine withdrawal syndrome is involved with craving, dysphoric mood, fatigue, increasing appetite, sleep disturbances, psychomotor retardation or agitation, and significant impairment in daily functioning (36). Early and effective management of acute withdrawal symptoms may improve treatment compliance for the patients.

There are some limitations of this study. Firstly, it was retrospective, single-center study. We only assessed hospitalized patients in the Alcohol-Drug Addiction Research, Treatment and Training Center in Elazığ Mental Health and Diseases Hospital, therefore results can not be generalized. We only investigated six types of psychoactive substances in the urine. We only included male patients. Assessment of the probation population, outpatients, and wastewater-based epidemiology analysis could provide a complementary view of the extent of drug consumption. Also clinical and sociodemographic data of the patients were not evaluated in detail way. Another limitation of this study was that not evaluate the impact of the 2020 and 2023 earthquakes on illicit drug use patterns. The number of hospitalized patients in our treatment center was higher in the May 2018-December 2019 group. This could be related to patients choosing clinics that are closer to them following the opening of the new Alcohol-Drug Addiction Research, Treatment and Training Centers in Türkiye.

The number of seizures, hospitalizations, and crimes related to methamphetamine has increased, indicating that methamphetamine poses a significant social problem for Türkiye. Monitoring changes in the illicit drug market and keeping track of factors related to drug markets could be helpful in taking appropriate measures. Drug market changes and economic crises may have a substantial impact on the drug use pattern in the community. More research, especially longitudinal and wastewater-based analysis studies, are needed to

investigate the extent of the changes in illicit drug use patterns. Also, research investigating acute management and relapse prevention in methamphetamine use disorder would be valuable.

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Yazar Katkıları: Tüm yazarlar ICMJE'in bir yazarda bulunmasını önerdiği tüm ölçütleri karşılamışlardır
Etik Onay: Bu çalışma için ilgili Etik Kuruldan etik onay alınmıştır.
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