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Correlates of injection drug use among individuals admitted to public and private drug treatment facilities in Turkey



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ABSTRACT

Background: The number of individuals seeking treatment for drug use has been increasing in recent years in Turkey. However, existing research on patterns and risk factors for drug use and how they vary by age and location in Turkey is limited.

Methods: We examined the socio-demographic characteristics, drug use behaviors, and treatment history of citizens admitted to inpatient substance use treatment at public and private facilities in Turkey during 2012 and 2013 and identified correlates of lifetime and current injection drug use.

Results: Of the 11,247 patients at the 22 public treatment centers in 2012–2013, a majority were male, lived with family, were unemployed, and had an average age of 27 years. Within private clinics ($n = 663$), a higher proportion was female (9.7% private vs. 5.7% public), aged 11–17 years old (13% vs. 7.4%), used cannabis as their primary drug (18.4% vs. 13.2%), and had previously received drug treatment (57% vs. 47.2%). Within public centers, 40.4% reported ever injecting drugs and 33.7% reported injecting in the past 30 days; the corresponding percentages at private clinics were 22.5% and 18.1%. Significant predictors of injection drug use included being homeless, being a temporal employee or unemployed, having higher education, heroin as a preferred drug, having a longer duration of drug use, and prior drug treatment.

Conclusion: Prevention and intervention efforts are needed to reduce the transition to heroin and injection drug use among youth as well as improve access to a variety of drug treatment options for people who use substances in Turkey.

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1. Introduction

Drug-related harms among people who inject drugs (PWID) within Central and Eastern European nations have been a growing concern over the last several decades (Barrio et al., 2013; Mathers et al., 2008; Degenhardt, 2012; Rhodes and Simic, 2005). One recent study utilizing data from 29 European countries found a higher proportion of heroin injection in Central and Eastern European countries than in Western European countries from 2005 to 2009

(Barrio et al., 2013). Alongside these changes are distinct patterns that are arising in Turkey, including increased numbers of individuals seeking treatment for heroin use for the first time, with 15 patients seen in 2004, compared to 677 in 2009 (Barrio et al., 2013).

Turkey's transit route makes it conducive to varied markets, and over time, Turkey has become a central location for the trade and utilization of narcotics like that of heroin (Akgoz et al., 2007). According to the United Nations Office on Drugs and Crime, Turkey is located within one of the major drug trafficking routes that originates in Afghanistan and extends to Europe, thus influencing both the number of drug seizures and rate of drug use within Turkey (UNODC, 2011). Alongside this strategic, yet susceptible location, Turkey is a unique country, with its geography and culture tied to both Middle Eastern and European countries and values (See Fig. 1). Turkey is considered a secularized country, yet still faces

Abbreviations: PWUD, people/person who use(s) drugs; PWID, people/person who inject(s) drugs; IDU, injection drug use.

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Fig. 1. Geographic position of Turkey.

national differences between local, traditional beliefs and more Westernized practices that have become part of this developing nation (Ciftçi Demirci et al., 2014). Regional differences in population demographics, urbanization, wealth, and income inequality may also contribute to differential risks for drug use across the country (Galea et al., 2003; Baumann et al., 2007). However, current research on the frequency, characteristics, trends, and associated risk factors of drug use is limited in scope and focuses predominantly in single cities or provinces of Turkey (Akgoz et al., 2007; Barrio et al., 2013). The limited research that has been conducted reports a high prevalence of cannabis use and polysubstance use among young populations as well as a reduction in the mean age at first heroin use (Akgoz et al., 2007; Ciftçi Demirci et al., 2014). These trends indicate that drug use is becoming more common within the country and seen more frequently among younger cohorts.

In addition to a small number of private treatment facilities, Turkey is home to 22 governmentally run and funded Research, Treatment and Training Centers for Alcohol and Substance Addiction (AMATEM centers) that provide outpatient and inpatient options. In accordance with Turkey's Law on Social Security and General Health Insurance, services provided at AMATEMs are completely financially covered for its citizens. The general health insurance covers 98% of its citizens and approximately 1.5% of Turkey's citizens utilize supplementary private insurance (Drechsler and Jütting, 2007; Colombo and Tapay, 2004; TUBIM, 2012). If patients do seek treatment at private facilities, which usually occurs due to desires for anonymity or VIP services, they must pay additional fees that are either covered by private insurance or paid out of pocket.

AMATEM's and private clinics' standard medication-assisted treatment (MAT) approach is through Suboxone, a buprenorphine/naloxone combination (EMCDDA, 2014). Methadone maintenance or buprenorphine therapies are not currently offered in Turkey. Alongside the medical detoxification process, motivational interviewing, cognitive behavioral therapy, and group therapy are offered at treatment facilities (EMCDDA, 2014). Even with such offerings, according to Turkey's Annual Drug Report (TUBIM), nearly half of the individuals admitted to AMATEMs subsequently returned for additional treatment (TUBIM, 2012).

The objectives of this study are to describe the characteristics of individuals admitted to both public and private facilities for inpatient drug treatment in Turkey, and to identify the correlates of PWID both in their lifetime and in the past month. Comprehensively analyzing and disseminating data collected on individuals

admitted for treatment is a critical first step in understanding what can be done to better assist people who use drugs (PWUD), identify holistic models to treatment, and formulate new intervention and prevention strategies.

2. Methods

2.1. Study participants

All Turkish citizens who were admitted to inpatient substance use treatment at one of the 22 AMATEMs or at private clinics in Turkey in 2012 or 2013 were included in this study. AMATEM centers are public and located in most major cities of Turkey, with services provided free of cost by Turkey's Social Security Institution (TUBIM, 2012). Both private and public treatment facilities offer outpatient and inpatient treatment; however, our data are limited to inpatient treatment. Turkey's National Drug Report states that approximately 150,000 patients seek outpatient treatment at the 22 AMATEMs (TUBIM, 2012). Therefore, those in inpatient treatment are only a minority of all individuals seeking drug treatment services.

For the purposes of this paper, the public treatment centers (AMATEM) and private clinics were grouped by location into seven geographic regions in Turkey, as depicted in Fig. 2: Marmara (including Istanbul, Bursa, and Edirne), Aegean (including Izmir, Manisa, and Denizli), Mediterranean (including Antalya, Adana, and Mersin), Central Anatolia (including Ankara, Konya, and Kayseri), Southeast Anatolia (including Gaziantep and Diyarbakir), Black Sea Region (including Samsun), and East Anatolia (including Elazig). Istanbul, Izmir, and Ankara have multiple treatment centers. Fig. 2 further depicts the general locations (as per the red dots) of the AMATEMs and private clinics.

2.2. Measures

Clinic staff obtained information about socio-demographic characteristics and drug use behaviors during intake at the public treatment center or private clinic. Intake is performed with a modified version of the Treatment Demand Indicator 2.0, which is created and supported by the European Monitoring Center for Drugs and Drug Addiction (EMCDDA, 2000). Since methadone and buprenorphine treatments are not available, such questions are not included in the questionnaire. Socio-demographic characteristics included gender, age, number of years of education, living

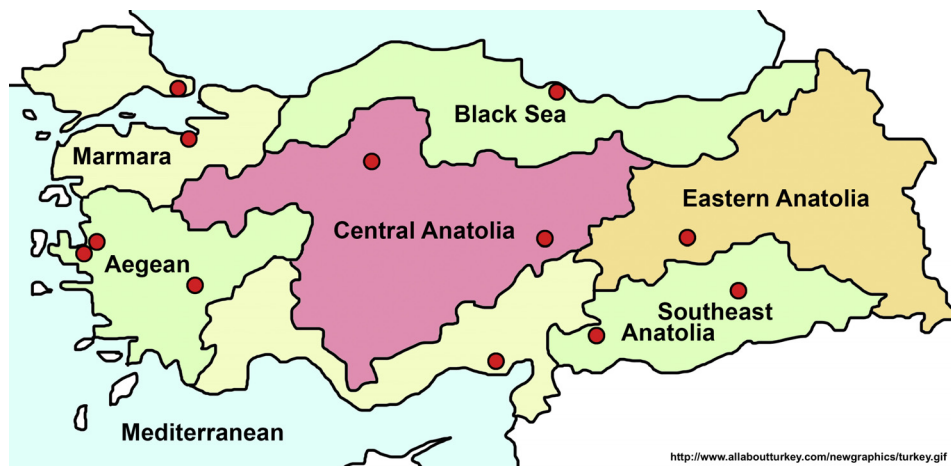


Fig. 2. Geographic regions in Turkey.

Key: Dots represent the general location of cities with public or private drug treatment facilities.

situation (alone, with family, with friends, in a shelter, or homeless), and employment status (regular job, temporal employee, unemployed, or other).

History of drug use and current drug using behaviors were also obtained, including age at first use, frequency of use in the past month, and preferred route of administration (injection, smoking, snorting, and eating or drinking) for up to three drugs, including the respondent's primary substance. Drug types included heroin, other opioids (e.g., meperidine and morphine), cocaine, cannabis, synthetic cannabis (e.g., bonzai), club drugs (e.g., ecstasy, ketamine, methamphetamine), prescription medications (e.g., alprazolam, diazepam, zolpidem), and inhalants (e.g., glue, paint thinner). From this information, we identified individuals who had used multiple types of drugs in the past month. We also calculated each individual's duration of drug use based on the minimum age of first using any reported substance. Individuals were also asked if they had ever injected a drug, and whether they had injected in the past 30 days. Finally, information was obtained about whether the individual had received inpatient drug treatment in any treatment center previously.

2.3. Statistical analysis

We first examined the socio-demographic characteristics, drug use behaviors, and previous treatment history of the population by year, location of treatment (AMATEM vs. private clinic), and age group. Since the characteristics of individuals receiving treatment in AMATEMs and private clinics differed from each other, we conducted additional analyses on each group separately. In particular, for each group, we calculated the proportion of individuals who reported injecting drugs ever in their lifetime and in the past 30 days and compared proportions of PWID across sub-groups defined by socio-demographic characteristics and drug using history, using chi-square tests for categorical variables and ANOVA for continuous variables. Finally, we estimated multiple logistic regression models predicting lifetime and current injection, including predictors that were at least marginally significant (p -value < 0.10) in bivariable analyses.

3. Results

In total, 11,247 individuals of Turkish nationality received inpatient treatment in one of the 22 public treatment centers (AMATEMs) throughout Turkey (4,586 in 2012 and 6,661 in 2013), whereas 663 individuals were admitted to private clinics for inpatient drug treatment. Table 1 shows the characteristics of

individuals treated in AMATEMs and private clinics, overall and, for those in AMATEMs, by year. Among those treated in AMATEMs, the majority were male (94.3%), had been living with family (94.7%), and were unemployed (64.4%); the average age of individuals was 26.6 years old (standard deviation [SD] = 8.0 years). Heroin was the most commonly reported drug of choice (75.4%), followed by cannabis (13.2%). The average age at first drug use was 19.6 years (SD = 6.0 years), and nearly half of those in treatment (47.2%) had been using drugs for more than five years. Nearly all individuals (98.8%) reported using drugs every day in the past month, and 32.0% reported using more than one type of drug in the past month. Nearly half of the individuals receiving treatment in AMATEMs (47.2%) had received drug treatment previously. The distributions of these characteristics were similar across years, except that the proportion of young adults (aged 18–29 years) was slightly higher in 2013, as was the proportion that reported using synthetic cannabis as their primary substance and snorting as their primary route of administration. Regionally, in 2013, a greater proportion of drug users were admitted to AMATEMs in Central Anatolia, whereas the proportion admitted to AMATEMs in the Mediterranean region was lower in 2013 than 2012.

When comparing the characteristics of individuals receiving drug treatment in private clinics vs. AMATEMs, it is apparent that a higher proportion of private clinic patients were female, aged 11–17 years old, had a regular job, used cannabis or synthetic cannabis as their primary drug, reported snorting as their primary route of administration, and had previously received drug treatment (Table 1).

Table 2 presents the distribution of socio-demographic characteristics and drug use behaviors among those treated in AMATEMs in each of four age categories: 11–17 year olds, 18–29 year olds, 30–39 year olds, and individuals 40 years of age or older. Significant differences were observed across age categories for all of the characteristics assessed in AMATEM centers, with the youngest age group exhibiting the most striking differences. In particular, compared to the older individuals in treatment, there was a higher proportion of females in the youngest age group (18.8%), as well as individuals living in a shelter (8.6%) and reporting being unemployed (75.6%). As far as drug using behaviors, the youngest individuals reported a higher use of cannabis (29.6%) and synthetic cannabis (7.5%) than older individuals as their preferred substance, although a substantial number still reported primarily using heroin (41.8%). The youngest individuals were also more likely to report using multiple types of drugs in the past month (50.1% vs. about 20–30% in the older age groups), and to report smoking and snorting as their preferred route of administration. Individuals in the oldest

Table 1
Socio-demographic characteristics, drug use behaviors, and treatment history of individuals receiving inpatient drug treatment in AMATEMs and private clinics in Turkey in 2012–2013.

	AMATEMs						Private clinics	
	2012 n = 4586		2013 n = 6661		Total n = 11247		Total n = 663	
	n	%	n	%	n	%	n	%
Socio-demographic characteristics								
Gender								
Female	271	6.0	362	5.4	637	5.7	64	9.7
Male	4311	94.0	6299	94.6	10610	94.3	599	90.4
Age								
11–17 years	356	7.8	472	7.1	828	7.4	87	13.1
18–29 years	2892	63.1	4508	67.7	7400	65.8	377	56.9
30–39 years	979	21.4	1279	19.2	2258	20.1	143	21.6
≥ 40 years	359	7.8	402	6.0	761	6.8	56	8.5
Mean age (SD)	27.0 (8.4)		26.3 (7.5)		26.6 (7.9)		26.3 (8.7)	
Living situation								
Alone	236	5.2	157	2.4	393	3.5	17	2.6
With family	4255	92.8	6391	96.0	10646	94.7	642	96.8
With friends	20	0.4	17	0.3	37	0.3	4	0.6
In a shelter	61	1.3	86	1.3	147	1.3	0	0.0
Homeless	14	0.3	9	0.1	23	0.2	0	0.0
Employment								
Regular job	1366	29.8	1880	28.2	3246	28.9	303	45.7
Temporal employee	331	7.2	0	0.0	331	2.9	0	0.0
Unemployed	2730	59.5	4507	67.7	7237	64.4	317	47.8
Unknown	159	3.5	274	4.1	433	3.9	43	6.5
Education								
No formal schooling	111	2.4	125	1.9	236	2.1	7	1.1
1–5 years	1276	27.8	1751	26.3	3027	26.9	125	18.9
6–8 years	1992	43.4	2855	42.9	4847	43.1	295	44.5
9–12 years	993	21.7	1641	24.6	2634	23.4	186	28.1
>12 years	214	4.7	289	4.3	503	4.5	50	7.5
Region								
Marmara	1716	37.4	2659	39.9	4375	38.9	551	83.1
Aegean	377	8.2	542	8.1	919	8.2	0	0.0
Mediterranean	1874	40.9	2371	35.6	4245	37.7	0	0.0
Central Anatolia	257	5.6	697	10.5	954	8.5	0	0.0
Southeast Anatolia	29	0.6	47	0.7	76	0.7	112	16.9
Black Sea Region	111	2.4	98	1.5	209	1.9	0	0.0
East Anatolia	222	4.8	247	3.7	469	4.2	0	0.0
Drug use behaviors								
Preferred drug								
Heroin	3413	74.4	5068	76.1	8481	75.4	418	63.1
Other opioids	42	0.9	88	1.3	130	1.2	9	1.4
Cocaine	73	1.6	57	0.9	130	1.2	27	4.1
Cannabis	676	14.7	809	12.2	1485	13.2	122	18.4
Synthetic cannabis	43	0.9	345	5.2	388	3.5	46	6.9
Club drugs	54	1.2	54	0.8	108	1.0	6	0.9
Prescription medications	61	1.3	50	0.8	111	1.0	4	0.6
Inhalants	224	4.9	190	2.9	414	3.7	31	4.7
Mean age at first drug use (SD)	19.8 (6.4)		19.5 (5.7)		19.6 (6.0)		19.6 (6.6)	
Duration of drug use								
≤2 years	804	17.5	1321	19.8	2125	18.9	161	24.3
3–5 years	1547	33.7	2266	34.0	3813	33.9	210	31.7
6–9 years	1059	23.1	1572	23.6	2631	23.4	140	21.1
≥10 years	1176	25.6	1502	22.6	2678	23.8	152	22.9
Frequency of drug use								
Every day	4456	97.2	6655	99.9	11111	98.8	660	99.6
2–6 days per week	98	2.1	5	0.1	103	0.9	3	0.5
1 day per week or less	32	0.7	1	0.02	33	0.3	0	0.0
Used multiple drug types in past month								
No	2993	65.3	4655	69.9	7648	68.0	426	64.3
Yes	1593	34.7	2006	30.1	3599	32.0	237	35.8
Preferred route of administration								
Inject	1706	37.2	2088	31.4	3794	33.7	120	18.1
Smoke	1121	24.4	1292	19.4	2413	21.5	172	25.9
Snort	1635	35.7	3136	47.1	4771	42.4	361	54.5
Eat or Drink	124	2.7	145	2.2	269	2.4	10	1.5
Mean age at first injection (SD) ^a	23.1 (5.8)		23.0 (5.5)		23.0 (5.6)		22.4 (5.4)	
Treatment History								
Previous drug treatment								
No	2471	53.9	3468	52.1	5939	52.8	285	43.0
Yes	2115	46.1	3193	47.9	5308	47.2	378	57.0

^a Among those who ever injected drugs.

Table 2

Socio-demographic characteristics, drug use behaviors, and treatment history of individuals receiving inpatient drug treatment in AMATEMs in Turkey in 2012–2013, by age category (n = 11,247).

	Age 11–17 years n = 828		Age 18–29 years n = 7400		Age 30–39 years n = 2258		Age ≥ 40 years n = 761		
	n	%	n	%	n	%	n	%	p-value ^b
Socio-demographic characteristics									
Gender									
Female	156	18.8	363	4.9	91	4.0	27	3.6	<0.001
Male	672	81.2	7037	95.1	2167	96.0	734	96.5	
Living situation									
Alone	1	0.1	174	2.4	120	5.3	98	12.9	<0.001
With family	754	91.1	7119	96.2	2120	93.9	653	85.8	
With friends	2	0.2	21	0.3	11	0.5	3	0.4	
In a shelter	71	8.6	73	1.0	1	0.04	2	0.3	
Homeless	0	0.0	12	0.2	6	0.3	5	0.7	
Employment									
Regular job	84	10.1	2073	28.0	851	37.7	238	31.3	<0.001
Temporal employee	5	0.6	216	2.9	88	3.9	22	2.9	
Unemployed	626	75.6	4860	65.7	1312	58.1	439	57.7	
Unknown	113	13.7	251	3.4	7	0.3	62	8.2	
Education									
No formal schooling	8	1.0	154	2.1	48	2.1	26	3.4	<0.001
1–5 years	151	18.2	1630	22.0	911	40.4	335	44.0	
6–8 years	552	66.7	3404	46.0	679	30.1	212	27.9	
9–12 years	114	13.8	1895	25.6	490	21.7	135	17.7	
>12 years	3	0.4	317	4.3	130	5.8	53	7.0	
Region									
Marmara	449	54.2	2754	37.2	881	39.0	291	38.2	<0.001
Aegean	83	10.0	565	7.6	190	8.4	81	10.6	
Mediterranean	102	12.3	3077	41.6	858	38.0	208	27.3	
Central Anatolia	113	13.7	627	8.5	148	6.6	66	8.7	
Southeast Anatolia	74	8.9	2	0.03	0	0.0	0	0.0	
Black Sea Region	5	0.6	116	1.6	59	2.6	29	3.8	
East Anatolia	2	0.2	259	3.5	122	5.4	86	11.3	
Drug use behaviors									
Preferred drug									
Heroin	346	41.8	5926	80.1	1656	73.3	553	72.7	<0.001
Other opioids	1	0.1	54	0.7	50	2.2	25	3.3	
Cocaine	0	0.0	55	0.7	60	2.7	15	2.0	
Cannabis	245	29.6	829	11.2	311	13.8	100	13.1	
Synthetic cannabis	62	7.5	250	3.4	70	3.1	6	0.8	
Club drugs	26	3.1	61	0.8	17	0.8	4	0.5	
Prescription medications	1	0.1	18	0.2	40	1.8	52	6.8	
Inhalants	147	17.8	207	2.8	54	2.4	6	0.8	
Mean age at first drug use (SD)	13.7 (1.7)		18.1 (3.7)		23.5 (5.9)		29.1 (10.0)		
Duration of drug use									
≤2 years	431	52.1	1442	19.5	216	9.6	36	4.7	<0.001
3–5 years	355	42.9	2948	39.8	435	19.3	75	9.9	
6–9 years	40	4.8	2025	27.4	490	21.7	76	10.0	
≥10 years	2	0.2	985	13.3	1117	49.5	574	75.4	
Frequency of drug use									
Every day	786	94.9	7341	99.2	2232	98.9	752	98.8	<0.001
2–6 days per week	30	3.6	47	0.6	19	0.8	7	0.9	
1 day per week or less	12	1.5	12	0.2	7	0.3	2	0.3	
Used multiple drug types in past month									
No	413	49.9	5018	67.8	1614	71.5	603	79.2	<0.001
Yes	415	50.1	2382	32.2	644	28.5	158	20.8	
Preferred route of administration									
Inject	87	10.5	2683	36.3	831	36.8	193	25.4	<0.001
Smoke	343	41.4	1448	19.6	472	20.9	150	19.7	
Snort	371	44.8	3164	42.8	878	38.9	358	47.0	
Eat or Drink	27	3.3	105	1.4	77	3.4	60	7.9	
Mean age at first injection (SD) ^a	15.2 (1.4)		21.2 (3.3)		27.2 (5.0)		33.0 (8.7)		
Treatment History									
Previous drug treatment									
No	626	75.6	4096	55.4	968	42.9	249	32.7	<0.001
Yes	202	24.4	3304	44.7	1290	57.1	512	67.3	

^a Among those who ever injected drugs.

^b p-value from Chi-square test for categorical variables and ANOVA for continuous variables.

age group were more likely to live alone (12.9%), have lower education (47.4% with 5 years or less of schooling), and to have received drug treatment previously (67.3%), compared to the younger age groups. The mean age at first drug use and drug injection was successively younger in each of the younger age categories. Similar breakdowns by age are not shown for those treated in private clinics because of the much smaller sample size in this group ($n=663$), as only three private clinics reported their information in 2012–2013.

Overall, 40.4% of the individuals treated in AMATEMs in Turkey in 2012–2013 reported ever injecting drugs, whereas 33.7% reported injecting in the past 30 days. As shown in Table 3, predictors of an increased odds of lifetime injection drug use (IDU) in bivariable analyses included gender, age, living situation, employment status, education level, region, heroin as preferred drug, duration of drug use, and previous drug treatment. Including these predictors in a multiple logistic regression model yielded the following statistically significant positive predictors of lifetime IDU (i.e., associated with an increased odds of injection): being homeless (adjusted OR [aOR]=3.68, 95% CI=1.14–11.89, compared to living alone); being unemployed (aOR=1.18, 95% CI=1.07–1.31, compared to having a regular job); having more than 12 years of schooling (aOR=1.72, 95% CI=1.19–2.48, compared to no formal schooling); receiving treatment in the Mediterranean region (aOR=2.04, 95% CI=1.84–2.25, compared to the Marmara region); reporting heroin as one's drug of choice (aOR=22.92, 95% CI=18.51–28.37); reporting greater duration of drug use (aOR=1.89, 95% CI=1.65–2.17 for 3–5 years, aOR=2.54, 95% CI=2.18–2.95 for 6–9 years, and aOR=3.12, 95% CI=2.64–3.69 for 10 years or more, all compared to 2 years or less); and having received drug treatment previously (aOR=1.88, 95% CI=1.71–2.06). Statistically significant negative predictors of lifetime IDU (i.e., associated with a decreased odds of injection) included being 40 years of age or older (aOR=0.66, 95% CI=0.48–0.90, compared to 11–17 years old); and receiving drug treatment in the Central Anatolia (aOR=0.65, 95% CI=0.55–0.78) and East Anatolia (aOR=0.38, 95% CI=0.29–0.50) regions of Turkey, compared to the Marmara region. Predictors of being a current PWID (in the past 30 days) were largely similar to predictors of ever being a PWID in bivariable as well as multivariable logistic regression analyses (Table 3), with the exception that living with family (aOR=0.72, 95% CI=0.56–0.93, compared to living alone) and reporting having used multiple types of drugs in the past month (aOR=0.86, 95% CI=0.77–0.96) were associated with decreased odds of current injection in the adjusted model, in addition to other statistically significant predictors.

The proportion of individuals receiving drug treatment in private clinics in Turkey who reported being PWID (22.5%) was considerably lower than that observed in AMATEMs, with 18.1% reporting having injected in the past 30 days. Table 4 presents the bivariable and multivariable associations between individual characteristics and IDU in this sample. Age, employment status, education, region, heroin as preferred drug, duration of drug use, and previous drug treatment were found to be associated with ever being a PWID in bivariable analyses. In the adjusted logistic regression model, the only statistically significant predictors of PWID were reporting heroin as one's drug of choice (aOR=13.90, 95% CI=5.60–34.52) and previous drug treatment (aOR=2.35, 95% CI=1.37–4.05). These were also the only statistically significant predictors of being a current PWID (Table 4) among private clinic patients.

4. Discussion

Using data from public and private facilities, we identified key characteristics of substance users in Turkey who sought inpatient

treatment, including differences in drug-using behaviors by age. Significant predictors of being a PWID included being homeless, being a temporal employee or unemployed, having higher education, using heroin as a preferred drug, having a longer duration of drug use, and receiving prior drug treatment.

Characteristics of substance users admitted for inpatient drug treatment in this study were similar to those observed in other countries. In studies done in South Africa, Malaysia, China, and Egypt, most users were also male, unemployed, homeless, utilized heroin as the drug of choice, and were between the age of 20 and 30 (Hasan et al., 2009; Saban et al., 2014; WHO, 2009). In 2012 and 2013, less than 6% of AMATEM inpatients and less than 10% of inpatients at private clinics were women. These low percentages of women are similar to those observed in other treatment-seeking populations in post-Soviet countries as well as in Malaysia, a Muslim Asian country, in which 97.6% of PWUD in public treatment were men between 20 and 30 years of age (Otiashvili et al., 2013; WHO, 2009). It is unclear whether the small proportion of women utilizing treatment in Turkey reflects a lower frequency of drug use among women or reluctance among women to seek treatment due to stigma or other barriers that hinder access to treatment (TUBIM, 2012). AMATEM doctors must report all patients, including the patient's name, to a national registry; this lack of anonymity at public centers may be an important barrier to treatment access, particularly among Muslim women, who may avoid seeking help for drug use due to fear of negative community consequences (Ay and Karabey, 2006; Ciftci et al., 2012). Indeed, in a study in multiple Middle Eastern countries, female Muslim drug users reported stigma and discrimination in the forms of social distancing, rejection, humiliation and denial of rights as frequent obstacles to treatment services (MENAHRA, 2013). By contrast, in the European Union and United States, where female drug users are less stigmatized, women comprise 20–40% of those in treatment (Otiashvili et al., 2013). Even in China, a country with some of the highest reported heroin use, 17% of inpatients were female, with this higher rate most likely attributed to the gender specific treatment options that China offers (WHO, 2009). We noted a higher proportion of women among private clinic patients, which may reflect a general increase in private sector drug use treatment in Turkey because PWUD are fearful of disclosing their status at public treatment centers.

We also noted striking differences in drug-using behaviors between age groups, which highlights the need for intervention and prevention efforts targeted towards adolescents in Turkey. Nearly 42% of the 11–17 year olds receiving treatment reported utilizing heroin as their drug of choice. In contrast, for adolescents admitted to treatment in the United States in 2011 only, 14.8% aged 12–14 and 16.9% aged 15–17 used heroin as a primary substance of choice (SAMHSA, 2014). Heroin did not even rank in the top two drugs of choice reported by 15–17 year olds in the US. In further juxtaposition, the misuse of prescription opioids in the US has been rising since 2002 (Johnston et al., 2009). One study reports that 6.2% of adolescents aged 12–17 used prescription pain relievers for nonmedical use in the U.S. while in Turkey less than 0.5% in this age group used prescription medications (SAMHSA, 2015). Similarly, in a study conducted in Finland, only 2% of those aged 14 or younger used opiates, and only 28% of those aged 15–24 used opiates (Onyeka et al., 2012). Within the 11–17 year age group in our study, heroin use started at the age of 13 and then increased at each year of age, with nearly 50% of 17 year olds reporting heroin as their substance of choice. Initiating heroin use at such a young age increases odds for transitioning to injection, developing risky injection practices, contracting blood-borne diseases like HIV/AIDS and HCV, and falling victim to drug overdose at earlier ages (Barrio et al., 2013; Griffin et al., 2003; Onyeka et al., 2012). Alongside this, we noted that half of the 11–17 year old Turkish inpatients used more than one drug per month, most likely reflecting the

Table 3

Correlates of lifetime and current injection drug use among individuals receiving inpatient drug treatment in AMATEMs in Turkey in 2012–2013 (n = 11,247).

	Lifetime injection drug use				Current injection drug use				
	n ever injected	% ever injected	p-value	Adjusted OR (95% CI)	n injected in past 30 days	% injected in past 30 days	p-value	Adjusted OR (95% CI)	
Total	4545	40.4			3794	33.7			
Socio-demographic characteristics									
Gender									
Female	197	30.9	<0.001	1.00 (ref)	141	22.1	<0.001	1.00 (ref)	
Male	4348	41.0		1.04 (0.84–1.29)	3653	34.4		1.25 (1.00–1.56)	
Age									
11–17 years	120	14.5	<0.001	1.00 (ref)	87	10.5	<0.001	1.00 (ref)	
18–29 years	3151	42.6		1.27 (1.00–1.61)	2683	36.3		1.34 (1.03–1.74)	
30–39 years	1008	44.6		1.26 (0.96–1.64)	831	36.8		1.19 (0.89–1.59)	
≥40 years	266	35.0		0.66 (0.48–0.90)	193	25.4		0.57 (0.40–0.80)	
Living situation									
Alone	167	42.5	0.005	1.00 (ref)	144	36.6	<0.001	1.00 (ref)	
With family	4307	40.5		0.78 (0.60–1.01)	3595	33.8		0.72 (0.56–0.93)	
With friends	18	48.7		1.53 (0.68–3.41)	16	43.2		1.70 (0.77–3.78)	
In a shelter	40	27.2		1.46 (0.83–2.58)	27	18.4		1.02 (0.56–.86)	
Homeless	13	56.5		3.68 (1.14–11.89)	12	52.2		3.84 (1.23–12.00)	
Employment									
Regular job	1200	37.0	<0.001	1.00 (ref)	996	30.7	<0.001	1.00 (ref)	
Temporal employee	163	49.2		1.31 (1.00 – 1.71)	147	44.4		1.41 (1.08–1.84)	
Unemployed	3067	42.4		1.18 (1.07–1.31)	2572	35.5		1.16 (1.05–1.29)	
Unknown	115	26.6		1.27 (0.95–1.71)	79	18.2		0.98 (0.71–1.34)	
Education									
No formal schooling	107	45.3	<0.001	1.00 (ref)	95	40.3	<0.001	1.00 (ref)	
1–5 years	1354	44.7		1.21 (0.89–1.65)	1148	37.9		1.12 (0.82–1.53)	
6–8 years	1814	37.4		1.07 (0.78–1.45)	1502	31.0		0.99 (0.73–1.34)	
9–12 years	1041	39.5		1.24 (0.90–1.69)	857	32.5		1.14 (0.83–1.55)	
>12 years	229	45.5		1.72 (1.19–2.48)	192	38.2		1.53 (1.06–2.21)	
Region									
Marmara	1461	33.4	<0.001	1.00 (ref)	1108	25.3	<0.001	1.00 (ref)	
Aegean	199	21.7		0.85 (0.69–1.04)	158	17.2		0.96 (0.78–1.19)	
Mediterranean	2544	59.9		2.04 (1.84–2.25)	2268	53.4		2.45 (2.20–2.72)	
Central Anatolia	248	26.0		0.65 (0.55–0.78)	180	18.9		0.66 (0.55–0.80)	
Southeast Anatolia	0	0.0		n/a	n/a	0		0.0	n/a
Black Sea Region	18	8.6		0.63 (0.36–1.12)	16	7.7		0.91 (0.51–1.64)	
East Anatolia	75	16.0		0.38 (0.29–0.50)	64	13.7		0.52 (0.39–0.70)	
Drug use behaviors									
Heroin as preferred drug									
No	99	3.6	<0.001	1.00 (ref)	73	2.6	<0.001	1.00 (ref)	
Yes	4446	52.4		22.92 (18.51–28.37)	3721	43.9		20.59 (16.12–26.29)	
Duration of drug use									
≤2 years	457	21.5	<0.001	1.00 (ref)	384	18.1	<0.001	1.00 (ref)	
3–5 years	1513	39.7		1.89 (1.65–2.17)	1237	32.4		1.67 (1.44–1.93)	
6–9 years	1315	50.0		2.54 (2.18–2.95)	1137	43.2		2.34 (2.00–2.74)	
≥10 years	1260	47.1		3.12 (2.64–3.69)	1036	38.7		2.73 (2.28–3.27)	
Used multiple drug types in past month									
No	3080	40.3	0.662	–	2517	32.9	0.007	1.00 (ref)	
Yes	1465	40.7		–	1277	35.5		0.86 (0.77 – 0.96)	
Treatment history									
Previous drug treatment									
No	1743	29.4	<0.001	1.00 (ref)	1447	24.4	<0.001	1.00 (ref)	
Yes	2802	52.8		1.88 (1.71–2.06)	2347	44.2		1.73 (1.57–1.90)	

Table 4

Correlates of lifetime and current injection drug use among individuals receiving inpatient drug treatment in private clinics in Turkey in 2012–2013 (n = 663).

	Lifetime injection drug use				Current injection drug use			
	n ever injected	% ever injected	p-value	Adjusted OR (95% CI)	n injected in past 30 days	% injected in past 30 days	p-value	Adjusted OR (95% CI)
Total	149	22.5			120	18.1		
Socio-demographic characteristics								
Gender								
Female	19	29.7	0.146	–	14	21.9	0.409	–
Male	130	21.7		–	106	17.7		–
Age								
11–17 years	2	2.3	<0.001	1.00 (ref)	2	2.3	<0.001	1.00 (ref)
18–29 years	95	25.2		2.20 (0.35–13.93)	80	21.2		2.08 (0.33–13.26)
30–39 years	37	25.9		1.46 (0.21–9.96)	27	18.9		1.51 (0.22–10.24)
≥40 years	15	26.8		1.38 (0.19–10.23)	11	19.6		1.45 (0.20–10.64)
Living situation								
Alone	6	35.3	0.179	–	6	35.3	0.042	1.00 (ref)
With family	141	22.0		–	112	17.5		0.37 (0.12–1.17)
With friends	2	50.0		–	2	50.0		3.75 (0.23–61.54)
Employment								
Regular job	85	28.1	0.006	1.00 (ref)	66	21.8	0.065	1.00 (ref)
Unemployed	58	18.3		1.08 (0.69–1.69)	49	15.5		1.11 (0.70–1.75)
Unknown	6	14.0		0.69 (0.25–1.88)	5	11.6		0.71 (0.25–2.01)
Education								
No formal schooling	2	28.6	0.008	1.00 (ref)	2	28.6	0.260	–
1–5 years	34	27.2		1.13 (0.17–7.42)	29	23.2		–
6–8 years	54	18.3		0.66 (0.10–4.23)	44	14.9		–
9–12 years	39	21.0		0.68 (0.10–4.38)	37	19.9		–
>12 years	20	40.0		1.74 (0.25–12.25)	8	16.0		–
Region								
Marmara	146	26.5	<0.001	1.00 (ref)	117	21.2	<0.001	1.00 (ref)
Southeast Anatolia	3	2.7		1.03 (0.20–5.36)	3	2.7		1.25 (0.24–6.67)
Drug use behaviors								
Heroin as preferred drug								
No	6	2.5	<0.001	1.00 (ref)	6	2.5	<0.001	1.00 (ref)
Yes	143	34.2		13.90 (5.60–34.52)	114	27.3		10.62 (4.17–27.06)
Duration of drug use								
≤2 years	30	18.6	0.003	1.00 (ref)	27	16.8	0.187	–
3–5 years	41	19.5		0.83 (0.46–1.50)	37	17.6		–
6–9 years	27	19.3		0.94 (0.49–1.82)	20	14.3		–
≥10 years	51	33.6		1.42 (0.72–2.80)	36	23.7		–
Used multiple drug types in past month								
No	101	23.7	0.307	–	74	17.4	0.514	–
Yes	48	20.3		–	46	19.4		–
Treatment history								
Previous drug treatment								
No	27	9.5	<0.001	1.00 (ref)	21	7.4	<0.001	1.00 (ref)
Yes	122	32.3		2.35 (1.37–4.05)	99	26.2		2.58 (1.47–4.54)

experimentation stage among youths who are new to substance use, but nonetheless, increasing the odds of developing chronic polysubstance use and related harms (Griffin et al., 2003).

The use of cannabis and synthetic cannabis was also particularly popular among the youngest Turkish inpatients. Bonzai, a type of synthetic cannabis in Turkey, is becoming a widespread drug of choice with a 19 times increase in bonzai possession arrests in Turkey from 2011 to 2012 (Çoban, 2014; Atik et al., 2015; Gurdal et al., 2013). Bonzai is a dangerous drug with debilitating effects on the body that can include increased risk of death or serious problems in the cardiovascular, neural or digestive systems (Çoban, 2014; Atik et al., 2015; Gurdal et al., 2013). We observed a nearly six-fold increase in synthetic cannabis usage from 2012 to 2013 (from 0.9% to 5.2% of inpatients), suggesting that bonzai is continuing its upward trend due to its promise of a stronger high, affordability, accessibility as it can be purchased online, and concealment of use since such usage will not create positive toxicological test results (Atik et al., 2015; Gurdal et al., 2013).

About 40% of the cohort had a history of injecting. This is consistent with other studies of PWID who were admitted for substance use treatment; for example, 45% of drug users in a study conducted in Finland administered their primary drug of choice intravenously (Onyeka et al., 2012). The characteristics of PWID in our study were similar to other studies conducted in the Middle East. In Afghanistan and Pakistan a higher proportion of PWID were male, unemployed, utilized heroin as a drug of choice, and were either homeless or displaced (Kuo et al., 2007; Sherman et al., 2005; Todd et al., 2009).

The homeless, albeit a small group comprising about 0.2% of inpatients, were at highest risk for injecting among the sample, illustrating the particular needs of this group. In a study conducted amongst homeless people aged 14–26 in Canada, a relationship was observed between perceived increased drug use and loss of housing (Cheng et al., 2014). Additionally, research in London among 1,000 homeless individuals reported that 88% were using at least one drug (Neale, 2008). In a study of homeless adolescents in Turkey, only 17% reported knowing that substance use could lead to increased risks like HIV/AIDS, further illustrating that knowledge on the risks of injection is scarce and outreach as well as health education would be beneficial for homeless populations within Turkey (Baybuga and Celik, 2004).

In adjusted models of AMATEM inpatients, individuals who received schooling for more than twelve years were more likely to inject than those with lesser education. This finding is converse to other studies that report greater proportions of PWID among those who have not completed secondary school and did not seek higher education (Abelson et al., 2011; Chikovani et al., 2011; Latimer et al., 2010; Reyes et al., 2006). PWID may be influenced by difficulties in finding heroin, as injection allows for a convenient and efficient means of getting high (Kuo et al., 2007; Todd et al., 2009). However, further research is needed to understand why injection may be the choice approach for the more educated in Turkey.

The locations that reported the highest rates of PWID were the Marmara and Mediterranean regions. More than half of the youngest inpatients, 11–17 year olds, were from the Marmara region, indicating that early-age prevention efforts may be particularly needed in this area. The Mediterranean region had a high percentage of patients that injected (59.9%), with the highest percentage among patients of the Adana AMATEM (63.9%). These regions may see higher rates of PWID because of the Balkan Route, a drug trafficking path for heroin that originates in Afghanistan and passes through the Marmara and Mediterranean regions (EMCDDA, 2015). In tandem, the most populated cities in Turkey are located in the Marmara and Mediterranean regions—Istanbul, Izmir, Antalya and Mersin. It has also been reported that although the Marmara and Mediterranean regions are considered some of the wealthiest

locations in Turkey due to tourism and geographic location as port cities, both localities have some of the largest income inequalities which can be linked to increased risk for drug use (Galea et al., 2003; Rhodes, 2009; Pickett and Wilkinson, 2010; Baumann et al., 2007). Further research is needed to understand whether these regions simply offer the most services and thus cater to higher numbers of patients, have higher intake due to patients traveling from other regions of Turkey that do not have treatment facilities, or whether these areas truly have a higher proportion of PWID.

Finally, we found that, in 2012 and 2013, about 47% of the public facility sample and 57% of those seen in private clinics reported having received previous inpatient treatment. In addition, lifetime and current injection was more common among those who had received previous treatment. In one study, patients who revolved in and out of treatment more than three times had significantly lower treatment improvement and success – the Turkish drug users with previous treatment may represent a similarly challenging population (Zhang et al., 2003). Furthermore, treatment programs offered in Turkey focus primarily on short-term medical detoxification that lasts two to four weeks through the delivery of Suboxone, but do not offer long-term maintenance therapy and consistent follow-up (TUBIM, 2012). This further suggests that treatment in Turkey could be more successful if a combination of short and long-term offerings were available and also shaped or modified to the characteristics and needs of the patient.

4.1. Limitations

This study had several limitations. First, since the data reflect inpatients admitted to Turkey's AMATEM centers and some private centers, the sample may not be representative of all PWUD and PWID in Turkey. Given the fact that the 22 AMATEMs are located in only 13 of the 81 provinces, a gap exists in Turkey's national data for areas that host neither AMATEMs nor private clinics that report to the state (TUBIM, 2012). This could cause limitations in understanding the demographics and drug-using behaviors of substance users, especially in northern and eastern areas of Turkey that lack treatment facilities. Observing only individuals in drug treatment also excludes drug users who are not informed about the public or private clinics, could not afford such help, or are not coming forward for treatment due to possible stigmas or cultural biases. In addition, the demographics of the private clinic inpatients were more limited, with some subgroups like homeless individuals not represented at all. The private clinics' sample size was also limited, resulting in very wide confidence intervals. Upon intake, the patients were asked about their history of drug use, potentially leading to misclassification among those who may not accurately remember the entirety of their substance use history, like initiation and duration of drug use. Since this is a cross-sectional study, we cannot infer temporality between the correlates and initiation of IDU. Finally, we did not collect data on some potential predictors of injection, like exposure to PWID among friends and family members, which limits our ability to fully identify all characteristics associated with injection in this sample.

4.2. Conclusion

Despite these limitations, this study provides critical insight into the characteristics of inpatient PWUD in Turkey and the correlates of PWID in this population. The young age at which Turkish inpatients begin using heroin suggests a strong need for prevention and intervention efforts focused on the transition to heroin use and injection among youth populations. Additional efforts are needed to reduce synthetic drug use, like bonzai, among adolescents. It is critical to note that Turkey is considered a “young population” with the average age being 29.22 in 2010, thus further empha-

sizing the importance of interacting with younger PWUD so as to slow the growing rates of drug use, especially with that of bonzai and heroin (CIDOB, 2011). Possible approaches could include opening more clinics specifically catered towards the needs of younger patients as well as integrating previously successful drug use prevention efforts in schools like that of working with at-risk groups, resistance-skills/life-skills training and social norms campaigns that correct misperceptions about drug use prevalence (Gottfredson and Wilson, 2003; Griffin et al., 2003).

In addition, further counseling and outreach services are needed for subgroups that are utilizing inpatient facilities at low rates, including women, people without family, and homeless individuals. Further qualitative and quantitative research is needed to clarify whether the lack of representation of these groups among those seeking treatment reflects lower rates of drug use or under-utilization of services, and will help identify specific barriers to treatment and how they can be overcome. Finally, the regional differences we identified, including high levels of PWID in the Mediterranean region, suggest that treatment programs could begin to offer counseling, detox methods geared towards harder drugs, and long-term maintenance therapy to create a more successful program in lowering addiction to heroin and preventing relapse in these areas.

As per regulation by Turkey's Ministry of Health, all substance use treatment facilities, may they be outpatient or inpatient, must be affiliated and working under local hospital administration. Due to this regulation, it can be difficult to open and operate clinics in all areas with need, since hospitals may not have the capacity to support treatment facilities and hospitals do not exist in some areas. Based on this limitation, it would be advisable to consider the creation of freestanding outpatient treatment facilities so as to increase available services. Moreover, since AMATEMs are located in only certain areas of Turkey, there is a great need, especially in the eastern and northern parts of Turkey, to conduct population studies of PWUD so these locales can be properly represented and their substance use patterns, demographics, and behaviors can be better understood.

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Contributors

Elif Mutlu and Mustafa Kemal Cetin compiled and prepared the data for dissemination, assisted as translational aids and edited the final document. Melissa Tracy conducted the statistical analyses and wrote and edited the drafts of the paper. Kamiar and Arash Alaei provided overall writing guidance and assisted in editing the drafts. Katherine Waye worked with Melissa Tracy in writing the drafts of the paper and preparing the manuscript. All authors have contributed to and approved the final article.

Conflict of interest

No conflict declared.

Ethical approval

The study was approved by the institutional review board at the Turkish Ministry of Health in Ankara, Turkey.

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