Recent Pattern of Substance Use Among Patients with Substance Use Disorders in a Rehabilitation and Treatment Centre for Addiction in Dubai

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BACKGROUND: Substance use disorders (SUDs) are a major contributor to global disease burden, premature mortality, and social disruption. While international data demonstrate shifting trends in polysubstance use, evidence from the United Arab Emirates (UAE) remains limited, particularly among individuals engaged in specialized treatment. **OBJECTIVE:** To describe the epidemiological profile, initiation factors, and current patterns of psychoactive substance use among patients diagnosed with SUDs in a rehabilitation and treatment facility in Dubai. **METHODS:** A descriptive, cross-sectional study was conducted among 103 patients meeting DSM-5 diagnostic criteria for SUDs who attended Erada Center for Treatment and Rehabilitation between May and August 2021. Data were collected using structured, interviewer-administered questionnaires addressing sociodemographic characteristics, substance use history, routes of administration, frequency of use, and psychosocial comorbidities. Descriptive and correlational analyses were performed using SPSS v27. **RESULTS:** The mean age at first substance exposure was 16.4 years (SD = 3.7). Curiosity (67%), peer or familial influence (28.2%), and hedonic motivation (21.4%) were primary initiating factors. Methamphetamine (50.5%), opioids (48%), and amphetamines (45.6%) were the most commonly reported substances. Intravenous administration predominated (68.9%), and 74% reported daily use. Frequent comorbidities included legal problems (63.7%), financial instability (50%), bereavement (41.2%), and exposure to violence (38.2%). Correlation analyses indicated distinct co-use clusters involving opioids, stimulants, and prescription medications. **CONCLUSION:** The study reveals early onset, high frequency polysubstance use with considerable health and psychosocial risks. Findings highlight the urgent need for culturally tailored evidence-based interventions and regional surveillance to guide treatment and public health strategies in the UAE.

Keywords | Substance Use Disorder – Polysubstance Abuse – Methamphetamine – Opioid Use Disorder – Intravenous Drug Use – Epidemiology – UAE – Addiction Medicine

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1 BACKGROUND

Global drug use has reached an estimated 316 million individuals, reflecting a 28% increase over the past decade and a corresponding 15% rise in overall prevalence (World Drug Report 2025, n.d.). Alarmingly, the number of individuals meeting criteria for drug use disorders has increased by 13%, yet only 8.1% of these individuals accessed treatment services in 2023 (World Drug Report 2025, n.d.). Cocaine markets have exhibited substantial expansion, particularly across Africa and Asia, accompanied by a concomitant rise in treatment demand. Synthetic drugs, most notably methamphetamine, continue to dominate international drug enforcement seizures, driven in part by shortages of naturally cultivated substances and the flexibility of synthetic production methods (World Drug Report 2025, n.d.). Conversely, a decline in the detection of new psychoactive substances (NPS) and associated mortality suggests that regulatory frameworks may be exerting a positive impact. However, this modest reduction is overshadowed by the overall increase in drug-related morbidity and mortality globally (World Drug Report 2025, n.d.).

Earlier reports indicate that over 284 million individuals aged 15–64 used drugs worldwide in 2020, reflecting a 26% increase over the previous decade (World Drug Report 2022). Young people, particularly those under 35, continue to represent the majority of drug users and of individuals receiving treatment for drug use disorders in regions such as Africa and Latin America (Global Drug Supply 2022). In the United States, the National Institutes of Health (2023) reported a marked escalation in drug overdose mortality: between 2015 and 2021, deaths involving stimulant-like substances such as cocaine or methamphetamine—combined with synthetic opioids other than methadone, increased nearly five-fold, rising from 12,122 to 53,495 cases (Tanz et al., 2025). These trends underscore the urgent need for evidence-based prevention, treatment, and harm-reduction strategies tailored to high-risk populations and evolving substance use patterns

In various African, South, and Central American nations, most individuals undergoing treatment for drug use disorders primarily struggle with cannabis-related issues. Conversely, opioid use disorders are predominantly addressed in Eastern and South-Eastern Europe, as well as Central Asia, according to the United Nations Office on Drugs and Crime (UNODC, 2022). Furthermore, the United States and Canada are witnessing alarming rates of overdose deaths, largely due to the widespread misuse of non-medical fentanyl. Preliminary estimates suggest that in 2021, the United States is expected to experience over 107,000 drug overdose fatalities, a significant increase from nearly 92,000 in 2020, as stated in the UNODC report (2022). Additionally, the report indicates that globally, 11.2 million people are engaged in drug injection practices. Among them, approximately half are afflicted with hepatitis C, 1.4 million with HIV, and 1.2 million with both infections (UNODC World Drug Report 2023).

Concerning drug trends, according to World Drug Report 2022, Seizures in the two major markets for methamphetamine have been increasing: in North America, they rose by 7% over the previous year, while in Southeast Asia, they increased by 30% from a year earlier, setting new records in both areas. Methamphetamine related seizures in Southeast Asia also reached a new high, jumping over 50% in 2020 compared to 2019 (UNODC, 2022). However, According to Surveillance of Opioid and Stimulant-Related Harms in Canada, published in 2023, Overdose deaths caused by illicit drugs have increased in recent years in North America. Between January 2016 and September 2021, there were 26,690 opioid accidental deaths in Canada. In 2021, a stimulant was also a factor in more than half (58%) of these fatalities (Apparent opioid and stimulant toxicity deaths - health-infobase.canada.ca 2023). Approximately 90% of all deaths from stimulant poisoning in 2021 also involved an opioid.

Despite women being a minority among global drug users, they exhibit higher drug consumption rates and a faster progression to drug use disorders compared to males. Presently, females constitute 45 to 49 percent of amphetamine users and non-medical recreational users of prescription stimulants, opioids, sedatives, and tranquilizers. Unfortunately, there is a significant disparity in gender-specific treatment options worldwide. Although women comprise over half of all amphetamine users, only one in every five individuals has access to specialized treatment for amphetamine use disorder.

In the Eastern Mediterranean Region (EMR), multiple substance use is a prevalent practice, and the availability of contaminated, adulterated substances on the drug market has increased the susceptibility of those who use substances to numerous health risks, complicating the clinical picture of drug intoxication. For instance, opium usage has been combined in several EMR nations with the use of stimulants like amphetamines, which have very distinct intoxication and withdrawal symptom profiles (Alblooshi et al., 2016).

Little research has explored contemporary patterns of drug use disorders in the United Arab Emirates (UAE), and existing studies remain limited. A recent study by Mhaidat et al. (2024) reported that the majority of participants (66.4%) used four or more substances, while 20.3% reported using two to three substances, and 13.3% reported using a single substance. The most frequently used substances among participants were Crystal methamphetamine (77%, n = 220), THC (65%, n = 187), Lyrica (pregabalin) (58%, n = 166), Tramadol (52%, n = 150), and Morphine (50%, n = 144), all of which were used by more than half of the study population (Mhaidat et al., 2024). These findings underscore the high prevalence of polysubstance use and the prominence of both illicit and prescription drugs in this population.

Historically, studies in the UAE have documented similar trends. The National Rehabilitation Center (NRC) conducted a 10-year retrospective analysis (2002–2011) examining individuals with drug use disorders and their treatment outcomes (Elkashef et al., 2013). The study reported a steady rise in substance use disorders over the decade, with an increasing number of young people using prescription medications and multiple substances. Alcohol was the most commonly reported substance (41.3%), followed by tetrahydrocannabinol (THC), benzodiazepines, amphetamines, inhalants (22.5%), and heroin (16.3%). Age-specific patterns were observed: patients under 26 years of age favored

heroin and other narcotics, whereas those aged 37–66 years primarily reported alcohol use. Additionally, more than half of the patients at Abu Dhabi's NRC were unmarried, unemployed, and possessed only a secondary education.

A subsequent cohort study conducted in 2015 by Alblooshi et al. (2016) further highlighted the increasing use of prescription medications in the UAE. Younger opioid users (under 30 years) were more likely to use prescription opioids, particularly Tramadol (67.2% of opioid users), whereas older users (over 30 years) predominantly used heroin. Consistent with the findings of the study by Mhaidat et al. (2024), most participants were polysubstance users, reflecting the ongoing complexity of substance use patterns in the region.

Alhyas et al. (2015) conducted a qualitative investigation of adolescents' perceptions of drug use and the factors influencing initiation, as well as parental perceptions and beliefs regarding adolescent substance use in Abu Dhabi. The study revealed that knowledge of drugs and their consequences varied across adolescent age groups and educational levels. Contributing factors to substance use included peer influence, limited awareness of drug-related harms, family-related challenges, accessibility and affordability of substances, boredom, and socioeconomic affluence.

Collectively, these studies indicate that while data from the UAE are limited, substance use disorders remain a significant public health concern. The integration of findings from Mhaidat et al. (2024) enhances our understanding of contemporary drug use patterns, particularly the prevalence of polysubstance use and the involvement of both illicit and prescription substances. Such insights are critical for designing targeted preventive and therapeutic interventions tailored to the profiles of individuals engaging in diverse substance use behaviors.

1.2 Aims

In this study, we aim to investigate the current pattern of SUD among a selected sample of patients with a substance use disorder (SUD) in a specialized center for treatment and rehabilitation for addiction in Dubai.

2 METHODS

2.1 Study design and setting

A secondary data analysis for an observational cross-sectional Epidemiological study design was used to collect data from the target population with a substance use disorder who were seen on all working days of the week and who were attending outpatient clinics for new admission and follow-up, as well as inpatients at Erada Center for Treatment and Rehabilitation in Dubai. Data collection was between May and August 2021, using a structured face-to-face interview questionnaire investigating the sociodemographic characteristics and Substance use profile Among Patients with Substance Use Disorders in a Rehabilitation and Treatment Centre for Addiction in Dubai.

2.2 Target population

Any patient aged 18 years old and above was included in the current study.

Inclusion criteria: Both genders above 18 years old, all socio-economic and educational levels, and patients who met the Diagnostic and Statistical Manual of Mental Disorders (DSM-5) criteria for substance use disorders with or without a history of suicidal or deliberate self-harm behaviour. Consultant Psychiatrist in Addiction Medicine based at Erada center confirmed the diagnosis.

Exclusion criteria: Patients with an acute psychiatric condition; patients with psychotic comorbidity, dementia, or delirium.

2.3 Data collection and study tool

The tool used in this study was a questionnaire consisting of a total of 20 questions distributed among two sections:

2.1 The sociodemographic characteristics section comprises 14 questions, including general questions about gender, age, marital status, level of education, occupation, residency, nationality, smoking status, income, and religion (Muneer et al., 2022).

2.2 Substance use profile composed of six questions, including screening regarding the first substance abused, age at exposure, cause of abuse, frequency of use, route of administration, and current abused drugs such as the following substances: amphetamine, methamphetamine, opiates, benzodiazepine, pregabalin, tramadol, and cannabis (Muneer et al., 2022).

2.3 Associated problem and behaviour section: The associated problem and behaviour among the patients with Substance Use Disorders section is composed of 13 questions asking about shared factors that include academic failure, aggressive tendencies or history of violent behaviour, bullying, victimization, family conflict, legal problems, history of trauma or abuse, hopelessness, impulsivity, low self-esteem, mental illness, peer rejection, physical illness or chronic pain, social withdrawal, relational, social, work or financial losses and previous suicide attempt(s), family history of suicide is included, and if the patient has access to a lethal weapon.

The validation of the above tool was performed by conducting a pilot study, which was done before the start of the research addressing ten patients, and a few ambiguous words were corrected to remove any misunderstanding. Senior psychiatrists in the field of addiction reviewed the tool to complete the validation process.

2.4 Sample size and analysis

All patients who met the inclusion criteria and signed the consent forms to enrol in this study between May and August 2021 were included in this study. The number of patients included in the study and who met the inclusion criteria during the study

period was 103. Moreover, descriptive statistical analysis using SPSS version 27 was used.

Justification of Sample Size and Study Period

All eligible patients who met the DSM-5 diagnostic criteria for substance use disorders and provided informed consent between May and August 2021 were consecutively enrolled, resulting in a total sample of 103 participants. Although the sample size is modest, it reflects the entire population of individuals engaged in treatment available at the center during the study period, thereby minimizing selection bias and ensuring full coverage of eligible cases. The 2021 data collection timeframe is methodologically relevant, as it captures Post Covid pandemic patterns of substance use characterized by global shifts in drug availability, consumption behaviors, and psychosocial stressors. Given the scarcity of empirical data from the UAE, this cohort provides a baseline for future national and regional research. Methodological rigor was further enhanced by confirming all diagnoses through consultant addiction psychiatrists and using a structured, pilot-validated, interviewer-administered questionnaire to mitigate recall bias and misclassification

2.5 Statement of Ethical Approval:

The Dubai Scientific Research Ethics Committee (DSREC) at Dubai Health Authority approved the study, titled "Epidemiological study of suicidal ideation and suicidal behaviour among patients with substance use disorders in a rehabilitation and treatment center for addiction in Dubai," with approval reference number DSREC-SR-05/2021_03. Additionally, approval was obtained from Erada Center for Treatment and Rehabilitation in Dubai with reference number ECTR-MED-GL-21032021-004 and Ethics Committee at Dubai Medical College, Dubai. Informed consent was obtained from all participants, and stringent confidentiality measures have been implemented.

3 RESULTS

Section I: Sociodemographic Characteristics of the Participants

Table 1 provides an overview of the sociodemographic features of the study's participants. More than half (52.4%) of the patients were hospitalized at the time of completing the questionnaire. Regarding age distribution, around 31% of participants were between 25 and under 30 years old, and 27% were under 25 years old. The participants had an average age of 29.3 years (Mean SD = 29.3 ± 7.6). The vast majority (92.2%) of respondents were male.

Over 56% of the sample had completed secondary education, while only 1.9% had limited or no literacy skills. Geographically, the highest proportion (46.6%) of participants lived in Dubai, with 25.2% residing in Sharjah. Marital status-wise, the majority (67%) were single, and an overwhelming majority (97.1%) identified as Muslims.

Table 1 | Socio-demographic characteristics of selected patients with substance use disorders in a rehabilitation and treatment center for addiction; Dubai 2021

Socio-demographic variable	N (%)
Patient type	
Inpatient	54 (52)
Follow-up	42 (40)
New assessment	7 (6.8)
Age (Years)	
< 25 Years	28 (27.2)
25–30 Years	32 (31.1)
30–35 Years	24 (23.3)
> 35 Years	19 (18.4)
Mean (SD)	29.3 (7.6)
Sex	
Male	95 (92.2)
Female	8 (7.8)
Education level	
Illiterate/read and write	2 (1.9)
Primary education	26 (25.3)
Secondary education	58 (56.3)
University degree	17 (16.5)
Residency	
Dubai	48 (46.6)
Sharjah	26 (25.2)
Abu Dhabi	12 (11.7)
Others	17 (13.5)
Marital status	
Single	69 (67)
Married	22 (21.4)
Separated	12 (11.6)
Religion	
Muslim	100 (97.1)
Others	3 (2.9)
Occupation	
Unemployed	74 (71.8)
Employed	16 (15.5)
Student	8 (7.8)
Others	5 (4.9)
Nationality	
UAE	97 (94.2)
Expat	6 (5.8)
Income in dirhams per month	
No income	72 (69.9)
< 5000	9 (8.7)
5000–15,000	8 (7.8)
> 15,000	14 (13.6)
Living arrangements	
With the family	94 (91.3)
Alone	7 (6.8)
In a shared apartment/room	2 (1.9)
Accommodation	
Villa	85 (82.5)
Flat	15 (14.6)
Others	3 (2.9)
Smoking status*	
I smoke cigarettes	85 (82.5)
I smoke other tobacco products	37 (35.9)
I smoke shisha	18 (17.5)
I do not smoke at all	4 (3.9)

*The total is not 103 because of multiple responses. Source:(Muneer et al., 2022).

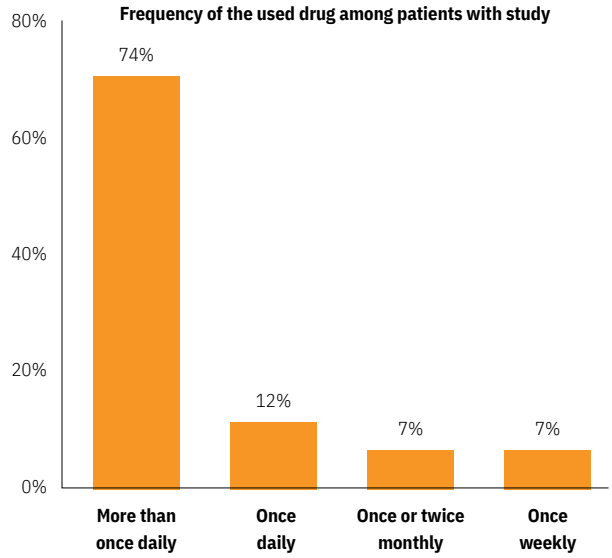

Figure 1 | Frequency of the used drug among patients with SUD in specialized center for Treatment and Rehabilitation for addiction; Dubai 2021

Regarding occupation, most participants (71.8%) were unemployed, 15.5% were employed, and 7.8% were students. Nearly 94% of the participants were Emirati citizens.

Over 70% of participants reported having no income, while 13.6% had a monthly income exceeding 15,000 dirhams. A significant majority (91.3%) stated that they lived with their own family. Regarding housing, 82.5% of patients resided in villas. Lastly, regarding smoking habits, the majority (82.5%) were cigarette smokers, with 35.9% using other tobacco products and 17.5% using shisha.

Section II: Pattern of Substance Use Among Patients with Substance Use Disorder

Table 2 delves into the patterns of Substance Use among individuals with substance use disorder. The study revealed that the average age of first drug exposure was 16.4 years (Mean ± SD = 29.3 ± 7.6). The most common reasons for initial substance use, as reported by participants, were curiosity among teenagers (67%), followed by the influence of addicted family members or friends (28.2%), and seeking joy (21.4%).

Regarding the types of substances currently in use, approximately 50.5% used Methamphetamine (50.5%) and Amphetamines (45.6%), while 48% used Opioids. Cannabis and alcohol use were reported by a smaller proportion of patients (15.5% and 9.7%, respectively).

In this study, injection was the most common method of drug administration (68.9%), followed by oral consumption (34%). Some participants reported using smoking and sniffing as alternative methods (19.4% for each).

The frequency of substance use varied, with approximately 74% of the sample reporting daily use, while 12% used substances more infrequently. Only 7% reported weekly use, and another 7% reported monthly use.

Table 2 | Characteristics of addiction profile among selected patients with substance use disorder in specialized center for Treatment and Rehabilitation for addiction in the present study, Dubai 2021

Addiction profile	Yes	No
	N (%)	N (%)
*Substance currently used**		
Methamphetamine	52 (50.5)	51 (49.5)
Opioids	50 (48.5)	53 (51.5)
Amphetamine	47 (45.6)	56 (54.4)
Pregabalin	35 (34)	68 (66)
Benzodiazepine	18 (17.5)	85 (82.5)
Cannabis	16 (15.5)	87 (84.5)
Alcohol	10 (9.7)	93 (90.3)
Other	8 (8.2)	92 (94.8)
*Route of administration**		
Injection	71 (68.9)	32 (31.1)
Oral	35 (34)	68 (66)
Sniffing (via the nose)	20 (19.4)	83 (80.6)
Smoking (like a cigarette)	20 (19.4)	83 (80.6)
*Causes of the first use of drugs**		
Teenage curiosity	69 (67)	34 (33)
Presence of an addicted person in the family or among friends	29 (28.2)	74 (71.8)
Joy-seeking	22 (21.4)	81 (78.6)
Psychological disorder	11 (10.7)	92 (89.3)
Lack of knowledge about complications of drugs	9 (8.7)	94 (91.3)
Low self-confidence	9 (8.7)	94 (91.3)
Having free time	9 (8,7)	94 (91.3)
Parents' divorce	7 (6.8)	96 (93.2)
Inability to resolve routine problems	7 (6.8)	96 (93.2)
To eliminate shyness	7 (6.8)	98 (95.1)
Having strict parents	5 (4.9)	98 (95.1)
Positive attitude toward drug abuse	5 (4.9)	100 (97.1)
Low cost of drugs	3 (2.9)	100 (97.1)
Age at the first exposure		
Mean (SD)		16.4 (3.7)

*The total is not 103 because of multiple responses. Source:(Muneer et al., 2022).

Section III: Possible Associated Problems and Behaviours Among Patients with Substance Use Disorders

Table 3 illustrates associated problems and behaviours among patients with substance use disorders. The most frequently reported issues and behaviours included legal problems (63.7%), significant financial problems (50%), recent death of a family member or close friend (41.2%), and exposure to domestic or family violence (38.2%). Additionally, participants reported recent breakdowns in family relationships (35.3%), emotional relationship breakups (35.3%), past suicide attempts (25.2%), and ongoing treatment for mental or psychiatric disorders (23.3%).

Correlation and Co-Use Patterns

Spearman's rank correlation analysis identified several statistically significant associations. **Tramadol use** was strongly correlated with both **MDMA** ($\rho = 0.49$, $p < 0.001$) and **cocaine** ($\rho = 0.49$, $p < 0.001$). **Methadone and buprenorphine use** were also strongly correlated ($\rho = 0.48$, $p < 0.001$), and both demonstrated significant positive correlations with **cannabis**

Table 3 | Associated problem and behavior among the patient with Substance Use Disorders as reported by participants in the present study; Dubai 2021

Associated problem and behavior	**Yes**		**No/I do not know**		**Total**	
	N	%	N	%	N	%
1 Legal problem led to prison	65	63.7	37	36.3	102	100
2 Suffer from major financial problem	51	50	51	50	102	100
3 Recent death of a family member or a close friend	42	41.2	60	58.8	102	100
4 Exposure to domestic/family violence	39	38.2	63	61.8	102	100
5 Recent breakup in Family relationship	36	35.3	66	64.7	102	100
6 Recent breakup in emotional relationship	36	35.3	66	64.7	102	100
7 Previous attempt of suicide	26	25.2	77	74.8	103	100
8 Currently on treatment plan for any mental / psychiatric disorder	24	23.3	79	76.7	103	100
9 Exposure to bullying at school/ home/work	23	22.5	79	77.5	102	100
10 Family history of psychiatric problem***	18	17.6	78	76.5	102	100
11 Access to guns or other firearms in the home	10	9.8	92	90.2	102	100
12 Family history of suicide***	8	7.8	91	89.2	102	100
13 Presence of medical condition:						
	9					
a) Hepatitis B/C	7	8.9	94	91.3	103	100
b) Hypertension	3	6.8	96	97.1	103	100
c) Diabetes	1	2.9	100	97.1	103	100
d) Ischemic Heart Disease	1	1	102	99	103	100
e) Chronic Kidney Diseases	13	1	102	99	103	100
f) other	21	13				
Total						

Source:(Muneer et al., 2022).

use (ρ = 0.41, p = 0.001). **Pregabalin use** correlated positively with **benzodiazepines** (ρ = 0.40, p = 0.002) and **cannabis** (ρ = 0.34, p = 0.009). **MDMA use** was associated with **cannabis** (ρ = 0.29, p = 0.027) and **alcohol** (ρ = 0.36, p= 0.006). A perfect correlation between **MDMA and cocaine** (ρ = 1.00, p < 0.001) was observed, although this finding is attributable to a single overlapping case and should be interpreted cautiously. Negative correlations were weak and not statistically significant, such as **amphetamine/methamphetamine with buprenorphine** (ρ = –0.20, p = 0.13).

Overlap analysis reinforced these associations. **Amphetamine/methamphetamine use** overlapped most frequently with **pregabalin** (24%; n = 14) and **opioids** (24%; n = 14). **Pregabalin use** co-occurred with **cannabis** in 12% (n = 7) of cases. Smaller but notable overlaps included **methadone with buprenorphine** (3.5%; n = 2) and **methadone with cannabis** (3.5%; n = 2). Several overlaps were rare (≤ 1 case), such as MDMA with benzodiazepines, methadone, or buprenorphine, which contributed to unstable or inflated correlation estimates.

Emergent Co-Use Clusters

The correlation and overlap data suggest three distinct substance co-use clusters:

1. **Opioid-related cluster** – methadone, buprenorphine, and cannabis, consistent with patterns of opioid substitution therapy and adjunctive cannabis use.
2. **Pregabalin–benzodiazepine–cannabis cluster** – highlighting pregabalin's emerging role in polysubstance misuse.
3. **Tramadol–MDMA–cocaine cluster** – reflecting stimulant and synthetic opioid co-use.

Alcohol showed only limited associations, primarily with MDMA. Although amphetamine/methamphetamine use frequently overlapped with pregabalin and opioids, correlations were not robust, suggesting heterogeneous co-use patterns

4 DISCUSSION

Substance Use Disorder (SUD) is a widespread issue that impacts governments, societies, and individuals daily. Healthcare professionals have noticed significant shifts in patterns of substance abuse, which carry severe consequences for patients and even treatment and rehabilitation facilities. Consequently, there is a growing demand for appropriate therapeutic measures. This study aims to examine the current substance use patterns among a specific group of patients with substance use disorders. This investigation can expand and enrich our understanding of these patterns, particularly within the local community, which boasts distinctive characteristics. This community is home to diverse international ethnicities while preserving its unique and traditional customs.

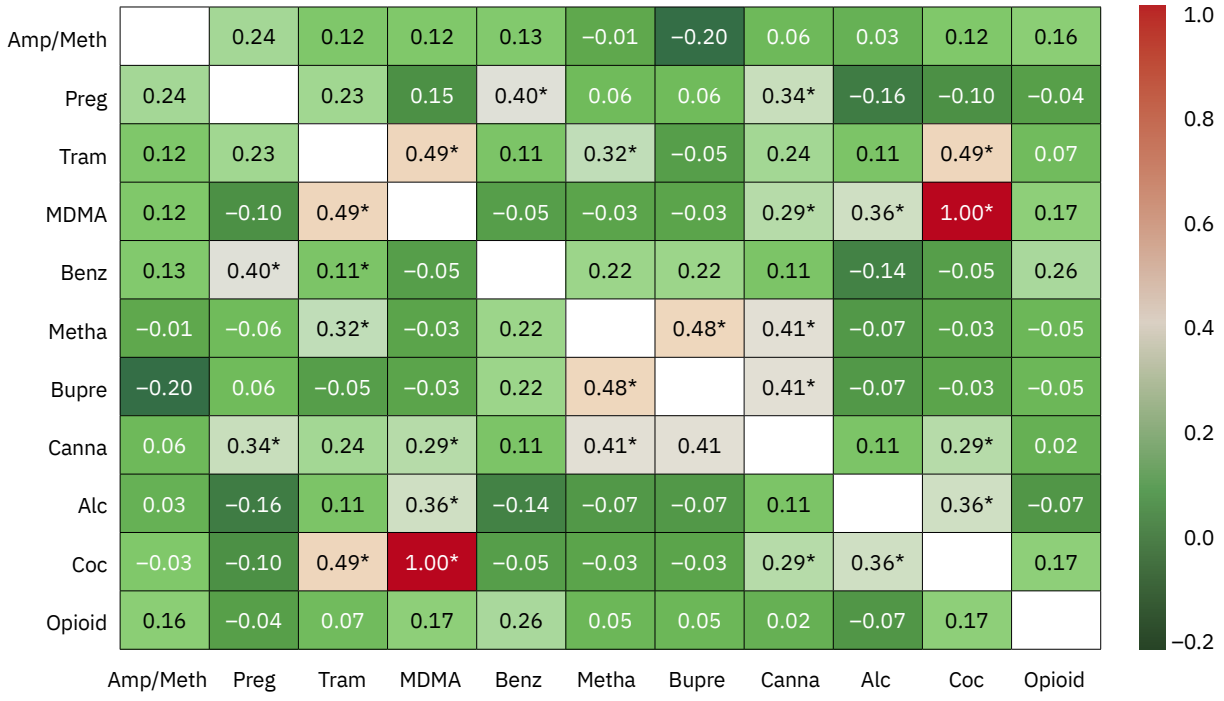

Figure 2 | Spearman Correlation Matrix (Significant at $p < 0.05$)

Sociodemographic Characteristics

The sociodemographic profile of the study population reveals patterns consistent with regional and international research on treatment seeking individuals with substance use disorders (SUDs). The mean age of participants was 29.3 years (SD = 7.6), with an age range of 18 to 55 years, indicating that substance use predominantly affects individuals in early to mid-adulthood. Similar age distributions have been reported in studies conducted in the UAE and the broader Middle East, where the peak risk period for substance use initiation and treatment engagement often falls between the late teens and early thirties (Mhaidat et al., 2024; Al-Sharqi et al., 2012).

The overwhelming male predominance in the present sample (92.2%) mirrors previous findings in the region, where sociocultural norms, gendered stigma, and differential treatment-seeking behaviors limit the visibility and representation of women in clinical settings (Alblooshi et al., 2016; Al Dhaheri, 2017). The underrepresentation of females may reflect both societal barriers to disclosure and the lack of gender-responsive treatment services, indicating a critical gap in service provision.

Educational attainment patterns in this cohort, with 56% having completed secondary education, align with studies suggesting that limited educational opportunities may contribute to both unemployment and increased vulnerability to substance use. The high proportion of unmarried individuals (67%) is similarly consistent with prior research linking substance use to social instability, delayed marriage, and disrupted family dynamics (Elkashef et al., 2013).

Unemployment was prevalent among participants (71.8%), and nearly 70% reported having no personal income. These figures reinforce the well-established association between economic marginalization and substance use disorders, particularly in contexts where financial instability intersects with social stressors and limited access to care. Such findings closely reflect data from Mhaidat et al. (2024), who documented a similar profile among polysubstance users, as well as earlier work by Al-Sharqi et al. (2012), which emphasized the role of socioeconomic disadvantage in addiction trajectories.

Notably, living arrangements in the present study show that 91.3% of participants resided with their families, a finding that may be culturally specific. In the Gulf region, extended family structures often obscure the social consequences of substance use, delaying treatment entry while simultaneously providing informal support. This phenomenon has been highlighted in studies emphasizing the dual role of the family as both a protective and permissive environment (Al Hosani, 2021).

The high prevalence of smoking (82.5%) and concurrent use of other tobacco products (35.9%) is consistent with evidence that nicotine dependency often co-occurs with other substance use and may serve as both a gateway and a reinforcing behavior.

Taken together, these sociodemographic findings reaffirm established risk markers including male gender, youth, unemployment, low income, and unmarried status and highlight the need for multidimensional, socially informed interventions. Identifying such high risk subgroups is essential for policymakers, treatment providers, and community organizations aiming to implement early intervention, prevention, and rehabilitation strategies tailored to contextual realities.

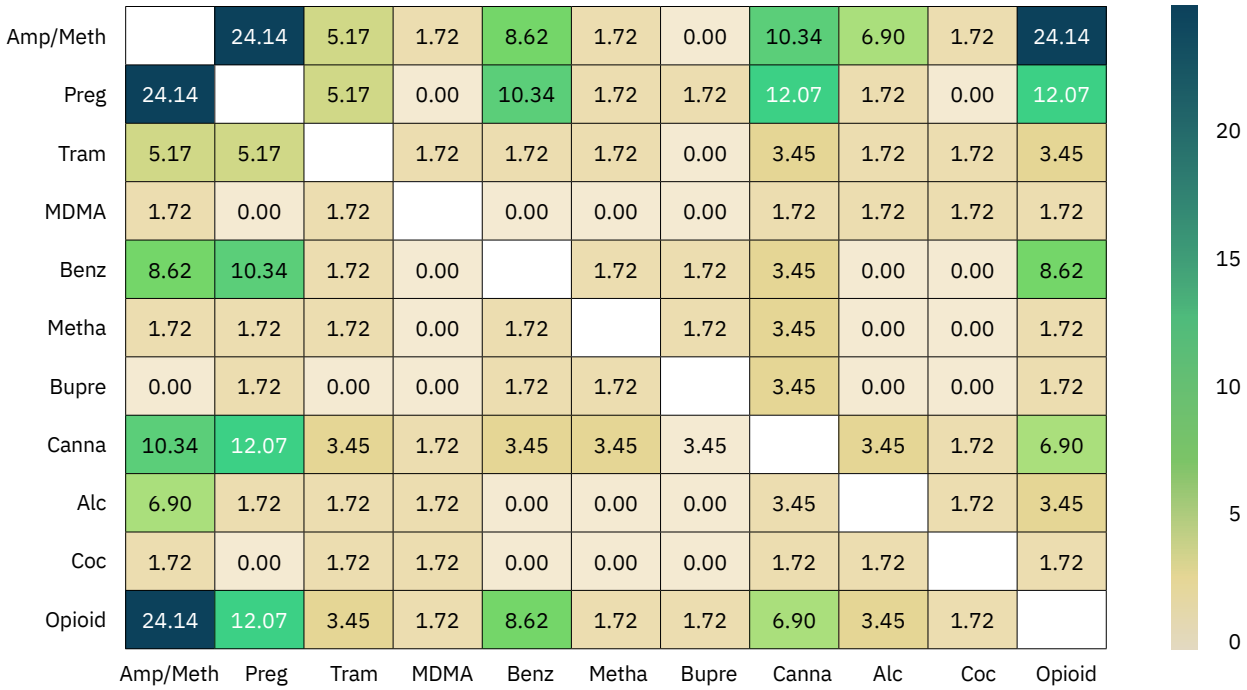

Figure 3 | Percentage of Overlapping Current Drug Usage

Pattern of Substance Use among patients with substance use disorder

The findings of the present study reveal a marked prevalence of polysubstance use, aligning with emerging regional and international literature. Methamphetamine (50.5%), amphetamines (45.6%), and opioids (48%) were the most frequently used substances, whereas the use of cannabis (15.5%) and alcohol (9.7%) was comparatively lower. These results parallel those of Mhaidat et al. (2024), who reported that 66.4% of participants consumed four or more substances, with crystal methamphetamine (77%), THC (65%), pregabalin (58%), tramadol (52%), and morphine (50%) featuring prominently. Collectively, these findings underscore the expanding role of both illicit stimulants and prescription medications in shaping polysubstance use trajectories across the region.

Comparative evidence from earlier UAE-based studies demonstrates a notable shift in the substance use landscape. Elkashef et al. (2013) and Al Dhaheri (2017) identified alcohol as the dominant substance of abuse, followed by THC, benzodiazepines, heroin, and inhalants. The lower prevalence of alcohol and cannabis in the present study may reflect evolving regulatory frameworks, shifts in availability, demographic changes, and changing social acceptability. Broader contextual influences including disruptions in drug supply chains during the COVID-19 pandemic, the expansion of digital drug markets, and altered trafficking networks—may further explain the rise in synthetic and prescription drug use (UNODC, 2022; Oksanen et al., 2020).

The increased involvement of prescription medications corroborates earlier findings by Alblooshi et al. (2016), who documented high rates of tramadol use among younger opioid users. However, unlike prior research, the present study did not stratify patterns by age group, highlighting an area for further investigation.

The incorporation of correlation and overlap analyses in this study offers deeper insight into polysubstance dynamics. Distinct co-use clusters involving opioids, stimulants, and prescription agents were identified, reflecting patterns reported internationally (Tanz et al., 2025; Mhaidat et al., 2024; Ellis et al., 2018; Peavy et al., 2021). The recurrent co-use of pregabalin is particularly noteworthy given its increasing misuse in the Middle East (Alblooshi et al., 2016; Mhaidat et al., 2024). Synergistic motivations—such as enhancing psychoactive effects, delaying opioid withdrawal, or counteracting sedation—likely contribute to these combinations (Leri et al., 2002; Palmer et al., 2020).

At the same time, interpretation of co-use patterns must be approached cautiously due to sample size constraints and sparse overlap frequencies. For example, the perfect correlation between MDMA and cocaine was attributable to a single case, underscoring the need for replication in larger cohorts.

Routes and frequency of administration observed in this study further illustrate the clinical severity of substance use. Injection was the predominant mode (68.9%), followed by oral consumption (34%), and smoking or sniffing (19.4% each). Daily or multiple daily use was reported by 74% of participants, elevating risks of overdose and bloodborne infections such as hepatitis, HIV, septicaemia, and myocarditis. These findings reinforce the urgent need for harm-reduction strategies and infectious disease surveillance within treatment settings.

Overall, the comparative analysis signals a substantive shift from historically alcohol- and cannabis dominant patterns toward stimulant and prescription driven polysubstance use. Future research with larger, more diverse samples is required to validate emergent co-use clusters, clarify the role of newer substances such as pregabalin, and inform region-specific treatment

models. The present findings establish a crucial foundation for advancing public health interventions, clinical planning, and policy development in the UAE.

4.1 LIMITATIONS OF THE STUDY

This study has several limitations that should be considered when interpreting the findings. First, the descriptive cross-sectional design precludes any causal inference and restricts the ability to assess changes in substance use patterns over time. The data were collected between May and August 2021, and although the period captures post-pandemic trends of clinical relevance, more recent data may reflect evolving patterns influenced by changing availability, legislation, and sociocultural dynamics.

Second, the sample size of 103 participants limits the statistical power and generalizability of the results beyond the study setting. The sample was drawn from a single treatment and rehabilitation center, and although consecutive recruitment minimized selection bias, the findings may not fully represent individuals with substance use disorders who are untreated or accessing other services. Additionally, the small number of female participants restricts gender-based comparisons and highlights the need for more balanced sampling in future research.

Third, although Spearman's rank correlation and overlap frequency analyses were incorporated to enhance analytical depth, the study did not employ multivariate or inferential modeling due to sample size constraints. As a result, potential confounding factors could not be fully explored.

Finally, the reliance on interviewer-administered questionnaires may introduce recall or social desirability bias, despite validation and standardized administration. Future studies employing longitudinal, multicenter designs with larger and more diverse samples, updated datasets, and advanced statistical modeling would improve external validity and deepen understanding of emerging polyubstance use trends in the region.

5 CONCLUSIONS

This study provides important insights into contemporary patterns of substance use among individuals diagnosed with substance use disorders in a specialized rehabilitation setting in Dubai. The findings reveal a clinically concerning trend of early-onset, high-frequency polysubstance use, with methamphetamine, opioids, and amphetamines emerging as the most reported substances. The predominance of intravenous administration further underscores the heightened risk of overdose and transmissible infections within this population.

The identification of distinct co-use clusters through Spearman's rank correlation and overlap frequency analyses offers a deeper understanding of substance combinations prevalent in this setting, particularly stimulant–opioid pairings and the concomitant use of prescription medications. These patterns carry important implications for clinical management, harm reduction strategies, and the development of targeted treatment protocols responsive to polysubstance use dynamics.

Sociodemographic characteristics such as male predominance, early age of onset, unemployment, and limited income underscore the need for tailored prevention and rehabilitation strategies that address structural and social determinants of substance use. Additionally, the high prevalence of psychosocial comorbidities, including legal problems, financial instability, bereavement, and exposure to violence, highlights the importance of integrated, multidisciplinary care models that extend beyond pharmacological treatment alone.

Given the scarcity of region specific empirical data, this study contributes valuable baseline evidence to inform addiction services, public health planning, and policy development in the UAE. However, the cross-sectional design, single center sample, and limited sample size warrant cautious interpretation and emphasize the need for longitudinal, multicenter research using larger cohorts and more advanced analytical methods.

Overall, the findings underscore the urgency of culturally appropriate, evidence-based interventions and the establishment of ongoing monitoring systems to address the evolving landscape of substance use in the region.

6 RECOMMENDATIONS

Based on the findings of this study, the following evidence-informed recommendations are proposed to address substance use disorders in Dubai and comparable settings:

1. Tailored Intervention Programs
Treatment plans should be designed to incorporate sociodemographic variables, including sex, age at onset, employment status, and socioeconomic position. Personalized interventions that reflect the specific characteristics and needs of individuals with substance use disorders are likely to enhance treatment engagement and efficacy.

2. Early Prevention Strategies
Preventive initiatives should prioritize adolescents and young adults, emphasizing education regarding the risks of early-onset substance use and the promotion of informed decision-making. Early interventions may mitigate progression to high-frequency polysubstance use.

3. Integrated, Multidisciplinary Treatment
Comprehensive treatment approaches are recommended to concurrently address substance misuse and associated psychosocial comorbidities, including legal challenges, financial instability, bereavement, and exposure to interpersonal violence. Multidisciplinary care models that integrate medical, psychological, and social services are critical to improving outcomes.

4. Polysubstance Use–Focused Care
Given the high prevalence of polysubstance use, treatment protocols should specifically target common substance combinations, particularly stimulant–opioid co-use and concomi-

tant prescription medication misuse. Structured interventions are necessary to reduce overdose risk and optimize clinical management.

5. Harm Reduction Measures
Harm reduction strategies should be implemented for individuals engaging in high-risk behaviors, such as intravenous drug use. Measures include access to sterile injecting equipment, naloxone distribution, overdose prevention education, and counseling on safer administration practices.

6. Monitoring and Surveillance Systems
Robust surveillance systems are essential to track trends in substance use, prevalence of polysubstance patterns, and emerging substances of abuse. Continuous data collection will facilitate evidence-based policymaking and enable timely, targeted interventions.

7. Community and Family Engagement
Active involvement of local communities and families in prevention, treatment, and rehabilitation programs is recommended to reduce stigma, strengthen support networks, and enhance adherence to treatment regimens.

8. Research and Predictive Analytics
Longitudinal, multicenter research is warranted to expand upon existing baseline evidence. The development of predictive models may facilitate early identification of shifts in substance use trends, allowing for proactive intervention strategies.

9. Regulatory and Policy Measures
Regulatory frameworks should aim to limit the accessibility of substances with high abuse potential. This includes enhanced monitoring of prescription medications and stricter controls on illicit drug distribution channels.

10. Capacity Building and Professional Training
Ongoing training for healthcare providers, educators, and law enforcement personnel is essential to improve identification, management, and prevention of substance use disorders. Training should focus on both clinical and psychosocial aspects of care.

11. Public Awareness and Education Campaigns
Culturally sensitive awareness campaigns targeting youth and the general population are recommended to reduce the appeal of substance use and promote harm-reduction behaviors.

12. Telehealth and Remote Services
Expansion of telehealth platforms is advised to provide counseling and treatment services to individuals in geographically remote or underserved areas, ensuring continuity of care and broadening access to evidence-based interventions.

13. Program Evaluation and Feedback
Prevention and treatment programs should be subjected to ongoing evaluation, incorporating patient feedback to refine interventions and enhance responsiveness to polysubstance use and comorbid psychosocial challenges.

These recommendations are directly informed by the study's findings of early-onset polysubstance use, high-risk behaviors, psychosocial comorbidities, and structural determinants of substance use. Their implementation requires culturally informed, evidence-based strategies, integrated care frameworks, and continuous monitoring to effectively address the evolving substance use landscape in the UAE.

These recommendations aim to address the complex nature of substance use disorders and provide a comprehensive approach to prevention, intervention, and treatment. Implementing these strategies requires collaboration among healthcare providers, policymakers, communities, and individuals affected by Substance Use Disorder.

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