

One-Year Retrospective Analysis of Adolescent Substance Use Treatment Clinic Cases

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Objective: This study aimed to examine the sociodemographic, clinical, psychosocial, and substance use characteristics of adolescents admitted to an outpatient Child and Adolescent Substance Addiction Treatment Center (ÇEMATEM) in Türkiye. It also compared adolescents who used a single substance with those who used multiple substances (polysubstance users).

Materials and Methods: The study retrospectively reviewed the medical records of 66 adolescents over a one-year period. Standardized assessment tools, including the Addiction Profile Index Adolescent Form (API-A) and the Substance Craving Scale (SCS), were used.

Results: The mean age of the sample was 15.97 ± 1.51 years. Polysubstance use was observed in 66.7% of the sample. Compared to monosubstance users, polysubstance users were more likely to be female, slightly older, and had significantly higher rates of prior hospitalization and suicide attempts. They also exhibited significantly higher levels of craving and addiction severity across all API-A domains. The most commonly used substances were alcohol, cannabinoids, stimulants, and methamphetamine. Half of the sample reported concurrent use of alcohol, stimulants, and cannabinoids.

Conclusions: Polysubstance use among adolescents is associated with greater psychosocial burden and clinical severity. These findings underscore the need for early identification and tailored interventions for this high-risk group.

Keywords: Suicide, Adolescent, Substance-related disorders, Risk factors, Cannabinoids, Polysubstance

1. INTRODUCTION

Adolescent substance use is a significant global public health concern. A large proportion of youth experiment with alcohol, tobacco, and illicit drugs during adolescence, and early initiation increases the risk of developing substance use disorders (SUDs) in adulthood.¹ In the United States, nearly one in ten adolescents meets criteria for a SUD annually,² while European surveys report that about 17% of 15–16-year-olds have used illicit drugs.³ In Türkiye, national reports have noted a growing concern about adolescent substance use.^{4,5} According to the 2019 Turkey Country Drug Report, the rate of cannabis use among young adults in the past year was 1.8%. The most commonly used illicit drug across the Turkish population was cannabis, followed by MDMA/ecstasy and cocaine. Illicit drug use was highest among males aged 15–34.⁴ According to another national drug report from Türkiye, the first illicit substance that 85.6% of drug users tried

was cannabis.⁵ Studies surveying youth populations have found that the average age of first substance use falls between 13 and 15 years.⁶

One particularly high-risk pattern is polysubstance use, defined as the concurrent or sequential use of multiple substances. While less common than single-substance use, polysubstance use has been linked to more severe physical, psychological, and social consequences. A systematic review of latent class analyses found that adolescents in polysubstance use groups consistently reported higher levels of peer and parental substance use, academic problems, and psychiatric symptoms.⁷ Longitudinal studies indicate that these adolescents are more likely to continue using substances into young adulthood and experience sustained impairment.⁸

Research also shows that polysubstance-using adolescents differ from their peers in several psychosocial domains. They often initiate use at an

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earlier age, experience more frequent psychiatric comorbidities, and have higher rates of trauma exposure and legal involvement.^{9,10} Family-related factors, such as low parental monitoring, substance-using family members, and criminal behavior within the household, have been associated with increased risk.¹¹ Peer influence is powerful during adolescence and plays a central role in substance use behaviors.^{11,12} Youth with substance-using peers are significantly more likely to engage in polysubstance use.¹¹ Conversely, high levels of parental disapproval and school engagement may serve as protective factors.^{11,13}

Psychiatric comorbidities, particularly externalizing disorders like ADHD or conduct disorder, are prevalent among adolescents with substance use problems.¹⁴ These conditions may increase impulsivity, emotional dysregulation, and risk-taking, all of which contribute to early and more hazardous patterns of use.^{14,15} Studies from Türkiye report that a large proportion of treatment-seeking adolescents present with comorbid psychiatric symptoms, legal problems, school dropout, and family conflict.^{16,17}

Despite increasing international evidence, research in treatment-seeking adolescent populations—particularly in low- and middle-income countries—remains limited. In Türkiye, outpatient clinics such as the Child and Adolescent Substance Addiction Treatment Centers (ÇEMATEM) provide specialized care for youth with substance-related problems. While a few clinical studies have examined the sociodemographic and clinical characteristics of ÇEMATEM patients, most have not differentiated between monosubstance and polysubstance users or examined their unique needs, such as treatment or psychosocial support.^{16,18}

For example, a study of 1,969 participants found that more than 60% of adolescents in treatment engaged in polysubstance use. The study also reported that marijuana was the most commonly used substance.¹⁸ More recent findings confirm that mixed-substance use disorders are the most frequent diagnosis among ÇEMATEM referrals, with significant psychosocial impairments reported across domains.¹⁶ Similarly, another

ÇEMATEM study found that 80% of hospitalized adolescents used multiple substances. Self-harm and conduct disorder were also highly prevalent.¹⁷ Recent studies from different regions of Türkiye consistently highlight high rates of comorbid psychiatric conditions, early substance initiation, and poor school engagement.^{16,19} However, despite this growing body of literature, comparative analyses between mono- and polysubstance users in outpatient-samples remain scarce.

The present study aims to address this gap by retrospectively examining one-year clinical data from adolescents admitted to a ÇEMATEM outpatient clinic in Türkiye. The study examines the sociodemographic, psychosocial, clinical, and substance use characteristics of this population and compares key variables between monosubstance and polysubstance users. We hypothesized that polysubstance users would show more severe addiction profiles and greater psychosocial burden than monosubstance users.

2. METHOD

2.1. Sample

The present study retrospectively reviewed the outpatient clinic records from a ÇEMATEM in Türkiye. One year of medical records from adolescents who presented to the ÇEMATEM outpatient clinic between June 2023 and May 2024 was included in the study. Information on the adolescents' sociodemographic characteristics, clinical data, and substance use profiles was systematically collected. The study was approved by the Scientific Research Ethics Committee of Sakarya University Faculty of Health Sciences (Approval No: 2024/75).

2.2. Measurements

Addiction Profile Index Adolescent Form (API-A): The Addiction Profile Index is a validated instrument designed to assess the extent and severity of addiction. The instrument consists of 25 items across five subscales and is administered to adolescents aged 15–18 with a history of alcohol or illicit substance use. It includes six subscores: substance use characteristics, diagnosis, impact on life, desires, motivation, and

a total score. The scale's Cronbach's alpha coefficient is 0.87.²⁰

Substance Craving Scale (SAS): This scale is an adapted version of the Penn Alcohol Craving Scale for addictive substance users. The scale comprises five items, each scored from 0 to 6, yielding a total score ranging from 0 to 30. A Turkish adaptation of the scale has been developed. The Cronbach's alpha coefficient for the entire scale was 0.84. Corrected item-total correlation coefficients ranged from 0.75 to 0.82.²¹

2.3. ÇEMATEM procedures

There is a standardized assessment protocol for all adolescents presenting to the ÇEMATEM outpatient clinic. An addiction-trained psychologist (counselor) evaluates the adolescent. Sociodemographic information, individual and family psychiatric history, clinical status, history of suicide attempts, and characteristics related to substance use are recorded on a structured assessment form. The adolescent is interviewed individually using motivational interviewing techniques by a counselor. Following this process, the API-A and SCS, standard assessment tools for adolescent substance use, are administered. Family interviews are also conducted with the adolescent's parents and documented using standardized forms. Once these forms and assessment scales are completed, they are reviewed by the center's child and adolescent psychiatrist. The psychiatrist conducts semi-structured interviews and administers additional assessment tools to evaluate psychiatric comorbidities. All follow-up and motivational interviews are conducted by consultants under the supervision of the child and adolescent psychiatrist.

2.4. Statistical analysis

The normality of continuous variables was assessed based on skewness and kurtosis values. Descriptive statistics were presented as frequencies, percentages, means, and standard deviations. Group comparisons for normally distributed variables were conducted using the Student's t-test. Chi-square tests were employed to analyze relationships between categorical variables. Statistical significance was set at $p <$

0.05, and 95% confidence intervals were reported where appropriate. All analyses were performed using IBM SPSS Statistics for Windows, Version 27.0 (Released in 2020; IBM Corp., Armonk, NY, USA).

3. RESULTS

Over the course of one year, 66 adolescents presented to the ÇEMATEM outpatient clinic a total of 280 times. Regular outpatient follow-up was provided for all 66 patients included in the study. The average number of applications to the polyclinic in a year was 4.24 ± 4.22 , and the most frequently applied patient applied 18 times. The sample consisted of 66 adolescents with a mean age of 15.97 years ($SD = 1.51$). The mean age of first cigarette use was 11.87 years ($SD = 2.14$), and the average number of cigarettes smoked daily was 18.38 ($SD = 12.40$). The mean age of first substance use was 14.46 years ($SD = 1.65$), and participants had an average of 2.25 siblings ($SD = 1.44$).

Of the participants, 57.6% ($n = 38$) were male and 42.4% ($n = 28$) were female. In terms of education, 33.3% ($n = 22$) were primary school graduates and 66.7% ($n = 44$) were high school students. Clinically, 34.8% ($n = 23$) had been hospitalized for alcohol or substance use, 56.1% ($n = 37$) had a history of running away from home, and 43.9% ($n = 29$) had attempted suicide. Additionally, 22.7% ($n = 15$) had experienced institutional care under state protection, 48.5% ($n = 32$) had a criminal history, 53.0% ($n = 35$) had a family history of alcohol or substance use, and 40.9% ($n = 27$) had a family history of criminal behavior. Detailed sociodemographic and clinical variables are presented in Table 1.

Table 1.*Sociodemographic and clinical characteristics*

Variables	Descriptive (n = 66)
	Mean (SD)
Age (year)	15.97 (1.51)
Age of first cigarette use (year)	11.87 (2.14)
Average number of cigarettes smoked daily	18.38 (12.40)
Age of first substance use (year)	14.46 (1.65)
Siblings	2.25 (1.44)
	n (%)
Gender	
Male adolescent	38 (57.6)
Female adolescent	28 (42.4)
Education	
Primary school graduate	22 (33.3)
High school student	44 (66.7)
Hospitalizations for alcohol/substance use	23 (34.8)
Running away from home	37 (56.1)
Suicide attempts	29 (43.9)
Institutional care under state protection	15 (22.7)
Criminal history	32 (48.5)
Family history of alcohol/substance use	35 (53.0)
Family history of criminal history	27 (40.9)

SD: Standard deviation.

Table 2.*Substance use characteristics in the last year*

Variables	Less than once per week	Once or more per week	Total
	n (%)	n (%)	n (%)
Methamphetamine use	13 (41.9)	18 (58.1)	31 (53.0)
Ecstasy use	21 (75.0)	7 (25.0)	28 (42.4)
Stimulant use (any)	15 (39.5)	23 (60.5)	38 (57.6)
Cannabis use	28 (57.1)	21 (42.9)	49 (74.7)
Synthetic cannabinoid use	14 (35.0)	26 (65.0)	40 (60.6)
Any cannabinoid use	25 (50.0)	25 (50.0)	50 (75.8)
Alcohol use	34 (63.0)	20 (37.0)	54 (81.8)
Pregabalin use	8 (50.0)	8 (50.0)	16 (24.2)
Volatile substance use	18 (78.3)	5 (21.7)	23 (34.8)
Polysubstance use	11 (25.0)	33 (75.0)	44 (66.7)

^a Thinner, bally, lighter fluid

Among the participants, methamphetamine was used by 53.0% (n = 31), with the majority (58.1%) using it once or more per week. Ecstasy was used by 42.4% (n = 28), though most of these individuals (75.0%) used it less than once per week. Stimulant use (any type) was reported by 57.6% (n = 38), with 60.5% of these using at least weekly. Cannabis use was highly prevalent at 74.7% (n = 49), with 42.9% of users reporting weekly or more frequent use. Synthetic cannabinoids were used by 60.6% (n = 40), and two-thirds of them (65.0%) used at least once per week. When considering any cannabinoid use (i.e., cannabis or synthetic cannabinoids), 75.8% (n = 50) reported use, evenly divided between low- and high-frequency users. Alcohol use was reported by 81.8% (n = 54), with 37.0% using weekly or more. Pregabalin was used by 24.2% (n = 16), equally divided between frequent and infrequent users. Volatile substance use (e.g., thinner, bally, lighter fluid) was less common at 34.8% (n = 23), with 78.3% using it less than once per week. Importantly, polysubstance use was observed in 66.7% (n = 44) of participants, and the majority of these (75.0%) reported using multiple substances at least once per week. Substance use characteristics in the last year are shown in Table 2.

Polysubstance users were significantly more likely to be female compared to monosubstance users ($p = .022$). Hospitalizations due to alcohol or substance use were significantly more frequent among polysubstance users (52.3%) than monosubstance users (13.6%) ($p = .002$). Suicide attempts were also more common in the polysubstance group (54.5%) compared to the monosubstance group (22.7%) ($p = .014$).

Although not reaching statistical significance, polysubstance users showed higher rates of running away from home (34.1% vs. 59.1%, $p = .053$), criminal history (43.2% vs. 68.2%, $p = .055$), and institutional care history (72.7% vs. 86.4%, $p = .213$) compared to monosubstance users. No significant group differences were observed in educational level, family history of substance use, or family criminal history ($p > .05$ for all). Table 3 presents a detailed comparison of clinical and psychosocial variables between the two groups.

Table 3.

Comparison of clinical and psychosocial variables between mono-substance and polysubstance users

Variables	Monosubstance use (n = 22)	Polysubstance use (n = 44)	Statistics	p
	n (%)	n (%)	χ^2	
Gender			5.242	.022
Male adolescent	17 (77.3)	21 (47.7)		
Female adolescent	5 (22.7)	23 (52.3)		
Education			.034	.854
Primary school graduate	7 (31.8)	15 (34.1)		
High school student	15 (68.2)	29 (65.9)		
Hospitalizations for alcohol/substance use			9.170	.002
Present	3 (13.6)	23 (52.3)		
No	19 (86.4)	21 (47.7)		
Running away from home			3.753	.053
Present	13 (59.1)	15 (34.1)		
No	9 (40.9)	29 (65.9)		
Suicide attempts			6.028	.014
Present	5 (22.7)	24 (54.5)		
No	17 (77.3)	20 (45.5)		
Institutional care under state protection			1.553	.213
Present	19 (86.4)	32 (72.7)		
No	3 (13.6)	12 (27.3)		
Criminal history			3.670	.055
Present	15 (68.2)	19 (43.2)		
No	7 (31.8)	25 (56.8)		
Family history of alcohol/substance use			1.507	.220
Present	12 (54.5)	17 (38.6)		
No	10 (45.5)	27 (61.4)		
Family history of criminal history			1.968	.161
Present	15 (68.2)	22 (50.0)		
No	7 (31.8)	22 (50.0)		

Group comparisons revealed several significant differences between adolescents who used a single substance and those who engaged in polysubstance use. The mean age of polysubstance users was significantly higher than that of monosubstance users ($p = .041$). Although no

significant group differences were found in the age of first substance use ($p = .079$) or age of first cigarette use ($p = .184$), polysubstance users reported significantly higher craving levels as measured by the Substance Craving Scale ($p = .012$).

Regarding API-A subscales, polysubstance users scored significantly higher across all domains. Specifically, they reported higher scores in substance use characteristics ($p < .001$), number of diagnoses ($p < .001$), impact on life ($p < .001$), craving ($p < .001$), and motivation ($p = .024$). Furthermore, the total API-A score was

significantly higher in the polysubstance group compared to the monosubstance group ($p = .004$). Although polysubstance users also reported a higher average number of cigarettes smoked per day, this variable was not statistically significant. Table 4 provides a detailed comparison of substance use profiles between groups.

Table 4.

Comparison of substance use profiles between monosubstance and polysubstance users

Variables	Mono substance use	Poly substance use	Statist ics	p
	Mean (SD)	Mean (SD)	t	
Age (year)	15.43 (1.48)	16.23 (1.47)	-2.088	.041
Age of first substance use (year)	14.33 (3.06)	14.48 (1.50)	-0.140	.079
Average number of cigarettes smoked daily	17.05 (9.95)	19.00 (13.46)		
Age of first cigarette use (year)	12.40 (2.11)	11.62 (2.13)	1.344	.184
Substance craving scale	8.29 (5.31)	15.80 (8.80)	-2.141	.012
API-A				
Substance use characteristics	0.75 (0.67)	3.15 (1.34)	-6.453	<.001
Diagnosis	3.82 (3.71)	13.29 (5.06)	-5.714	<.001
Impact on life	5.09 (4.64)	15.76 (6.72)	-4.887	<.001
Craving	1.27 (1.42)	2.38 (1.35)	-2.342	<.001
Motivation	1.55 (1.69)	3.41 (0.92)	-3.488	.024
Total	4.81 (3.32)	12.66 (3.56)	-7.826	.004

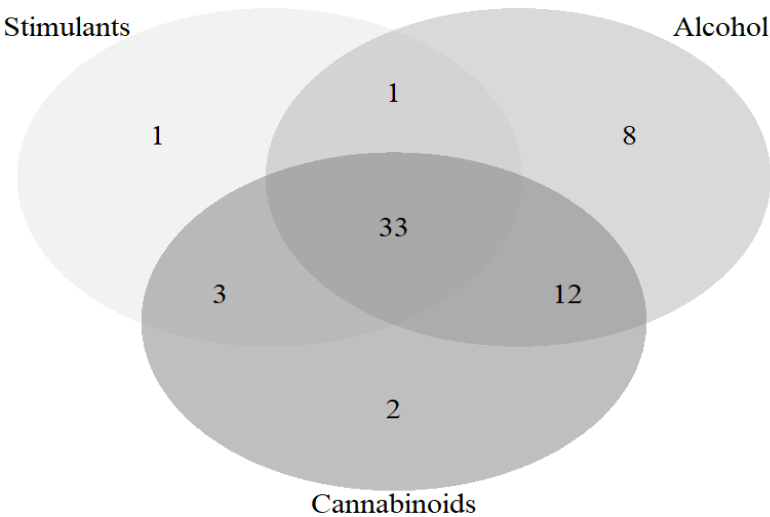
SD: Standard deviation; API-A: Addiction Profile Index Adolescent Form.

Figure 1 illustrates the overlap between stimulant, alcohol, and cannabinoid users. Of the 66 adolescents, 38 reported using stimulants, 54 used alcohol, and 50 used cannabinoids within the past year. A substantial proportion reported overlapping use, with 34 individuals using both

stimulants and alcohol, 36 using both stimulants and cannabinoids, and 45 using both alcohol and cannabinoids. Notably, 33 participants reported using all three substance categories, indicating a high level of polysubstance use within the sample.

Figure 1.

Distribution of alcohol and substance users



4. DISCUSSION

This study examined adolescents presenting to an outpatient ÇEMATEM clinic over one year, focusing on the differences between single and polysubstance users. The majority of the sample (66.7%) were polysubstance users. Compared to monosubstance users, polysubstance users were more likely to be female and slightly older. Polysubstance users also had significantly higher rates of prior hospitalizations and suicide attempts. Their substance craving and addiction severity scores were higher across all domains of the API-A. Although both groups started substance use at similar ages, polysubstance users showed more severe psychosocial profiles. The most commonly used substances were alcohol, cannabis, synthetic cannabinoids, and stimulants. Notably, 50% of the adolescents reported concurrent use of stimulants, alcohol, and cannabinoids within the past year.

Our findings align with international literature, which has consistently shown that polysubstance-using adolescents tend to experience worse outcomes than their monosubstance-using peers.²² Previous studies have demonstrated that polysubstance use in youth is associated with earlier onset of substance use, greater psychiatric comorbidity, and a higher likelihood of continuing substance use into adulthood.^{7,8} Similar to our results, these studies also found that polysubstance users are more likely to suffer from externalizing behaviors, legal issues, and mental health problems such as depression and anxiety.²³ In our cohort, polysubstance users had significantly higher rates of prior suicide attempts. This highlights the significant negative impact of co-occurring substance use on mental health. Our results also confirm previous research showing that polysubstance users tend to have higher craving levels, indicating a more entrenched addiction.²⁴

In contrast to previous studies that frequently reported higher rates of polysubstance use among male adolescents^{25,26}, 52% of polysubstance users in our study were female adolescents. This finding is consistent with recent data from Türkiye and globally showing a narrowing gender gap.^{10,27,28} A study in the ÇEMATEM sample found that 89.8%

of females and 77.8% of males used more than one substance, indicating a relatively higher prevalence in females.²⁸ Similarly, another recent study reported that polysubstance use was statistically significantly more common in females (48.5%) than in males (27.8%).²⁹ In contrast, although one study reported a slightly lower prevalence (41%)¹⁶, another found that all adolescents in the sample used more than one substance, with marijuana (72%) and methamphetamine (34%) being the most common¹⁹. This shift underscores the importance of incorporating gender-specific considerations into prevention and intervention strategies, as female adolescents may encounter unique psychosocial pressures related to substance use.

Locally, our findings support previous research from Türkiye indicating that polysubstance use is common among treatment-seeking adolescents. For example, previous studies have also found cannabis to be the most frequently used substance, a trend observed in our sample.^{16,18} This trend is mirrored in other national studies reporting high rates of polysubstance use among both genders: 81.5%²⁸, 80%¹⁷, and 60.2%¹⁸. Furthermore, our finding that 60% of polysubstance users had a family history of substance use and 49% had a criminal history is consistent with previous national studies showing that familial and environmental factors play a significant role in adolescent substance use.

In line with these findings, our study observed significantly higher API-A and SAS scores among polysubstance users, reflecting more severe addiction profiles and greater psychosocial burden. These results underscore the clinical necessity of distinguishing between mono- and polysubstance users in treatment planning, particularly given the elevated levels of craving, impairment, and comorbidities in the latter group.

4.1. Strengths and limitations

A major strength of this study is its comprehensive assessment of adolescents using standardized tools in a clinical setting. The inclusion of both male and female participants, as well as a range of substance types, enhances the study's generalizability. Distinguishing between mono-

and polysubstance users also enabled the identification of specific clinical needs.

However, the study has limitations. The retrospective design prevents causal conclusions. As the data were drawn from a single clinical site, findings may not be generalizable to national populations. The small sample size limits generalizability. Self-report and chart-based data are subject to reporting bias. Additionally, psychosocial variables such as socioeconomic status, peer influence, and trauma history were not included. Polysubstance use was defined based on past-year use, which may have overlooked the frequency and context of substance consumption.

4.2. Future directions

Future research should focus on longitudinal studies to track the long-term outcomes of adolescents with polysubstance use. Understanding how these adolescents fare in terms of mental health, educational attainment, and social integration over time would provide valuable insights into the persistence of substance use and related impairments. In addition, qualitative studies exploring the experiences and motivations of adolescents who engage in polysubstance use could inform more targeted prevention and intervention strategies.

5. CONCLUSION

This study highlights the significant psychosocial and clinical burden experienced by adolescents engaged in polysubstance use. Polysubstance users tend to have more severe addiction profiles and greater psychosocial impairment compared to their monosubstance-using peers. These findings underscore the need for integrated, intensive interventions that address both substance use and co-occurring mental health issues. Policymakers and clinicians should prioritize early identification and tailored interventions for polysubstance-using adolescents to mitigate the long-term impact of substance use on their lives.

Article Information Form

Authors' Contribution

Conception: MTT; Design: MTT; Supervision: MTT, ES; Materials: MTT, ES; Data collection: MTT, ES;

Analysis: MTT; Literature Review: MTT; Writing: MTT; Critical Review: MTT, ES.

The Declaration of Conflict of Interest/ Common Interest

No conflict of interest or common interest has been declared by authors.

The Declaration of Ethics Committee Approval

The study was approved by the Scientific Research Ethics Committee of Sakarya University Faculty of Health Sciences on April 14, 2024 (Approval No: 2024/75).

Artificial Intelligence Statement

No artificial intelligence tools were used while writing this article.

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