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Investigation of the relationship between cannabis use, opioid use and cognitive errors

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Abstract

Cognitive errors associated with cannabis and opioid have been investigated and compared, but the relationship between cognitive errors questioning personal achievements (PA) and interpersonal relationships (IP) with these two types of substance has not been adequately investigated. We aimed to compare comorbid psychiatric symptoms, cognitive errors and substance use characteristics of patients diagnosed with cannabis use disorder (CUD) and opioid use disorder (OUD). In this cross-sectional study, Symptom Checklist-90-Revised (SCL-90-R) was used and a sociodemographic data was obtained. The cognitive distortions scale (CDS) was used to evaluate cognitive errors. The patient group consisted of 60 (30 CUD and 30 OUD) and the control group consisted of 30 males. Patient and control groups were similar in terms of mean age and educational status ($p>0.05$). The mean duration of substance use of the CUD group was 43.56±31.13 months, while the OUD group was 68.00±33.20 months ($p=0.005$). The somatic (SOM) ($p=0.011$) and paranoid (PAR) ($p=0.005$) subscales of SCL-90-R were significantly different in the CUD and OUD groups. There was a significant difference between CUD and OUD groups in terms of IP ($p=0.002$) and PA ($p=0.002$) sub scores and total scores ($p = 0.001$) of CDS. Our study reveals that cannabis use is associated with more cognitive errors than opioid use. Higher scores of SOM and PAR in the OUD group than in the CUD group were thought to be associated with longer substance use.

Keywords: Opioid addiction, cannabis, substance use disorder, cognition

Introduction

Although cognitions play a role in substance use disorder (SUD), substance exposure also affects cognition. Studies in risky groups show that cognitive errors are observed without substance use. Abnormalities associated with substance use also lead to further deterioration of cognitions and a vicious circle [1-3]. SUD can be seen with many mental and organic diseases. These comorbid conditions and disorders make the treatment process even more difficult and cause the cognitive processes to worsen directly or indirectly [4-6].

The assessment of cognitive errors that have an important place in the process of the disorders has become important and various measurement methods have been developed [7]. The Cognitive Distortions Scale (CDS) was recently translated into our language and evaluates cognitive distortions [8]. Orum et al. [2] reported that substance use was associated with a high level of cognitive error in the first study using CDS in patients with SUD. In this study, although the number of patients was not enough, the level of cognitive error was higher in cannabis users than in opioid users. Cannabis and opioid are the most commonly used substances [3]. Our hypothesis was that when the number of patients is increased, a significant difference will continue between the cannabis and opioid groups in terms of CDS scores. In this study, we aimed to compare comorbid psychiatric symptoms, cognitive errors and substance use characteristics of patients diagnosed with cannabis use disorder (CUD) and opioid use disorder (OUD).

Materials and Methods

Study Sample

The study was planned as a cross-sectional study and compared patients with SUD who were followed in the Alcohol-Drug Addiction Research Treatment and Training Centre (AMATEM) at Kahta State Hospital with a control group. The targeted age was between 15-65 years. Local ethics committee approval was obtained, and all study participants provided written informed consent (2019/8-16).

Procedure

The patients with SUD were consecutive patients who were being followed at our outpatient clinic. After being seen during the

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baseline visit by the treating psychiatrist, each patient's eligibility for the study was evaluated, and if they were eligible, they were invited to participate in the study. The patients consisted of individuals with no substance detected in the urine, without any withdrawal or intoxication symptoms. Depending on the type of substance that these patients frequently preferred (substances that were positive in their urine toxic scans up to 1 month ago and confirmed verbally), they were classified as CUD and OUD. The control group consisted of healthy male volunteers without a self and family history of a SUD who were recruited from the hospital staff. Psychiatric pathology was determined by the Symptom Checklist-90-Revised (SCL-90-R). Urine toxicological analysis gave negative results in the control group. Interviews were conducted in an environment suitable for psychiatric examination.

Inclusion Criteria

Patients with SUD who were diagnosed according to the Diagnostic and Statistical Manual of Mental Disorders-5th Edition (DSM-5) [9] criteria were included. Patients who were admitted to the AMATEM outpatient clinic every 2 weeks regularly and whose urine toxic screening test was negative for the last 8 weeks were included in the study. According to the toxicological analysis findings, only cannabis and opioid users were included in the patient group. All of them were within normal limits in terms of their intelligence level.

Exclusion Criteria

According to the toxicological analysis findings, those who used substances other than cannabis and opioids were excluded from the patient group. Thirteen patients with benzodiazepine, 34 patients with opioid, 15 patients with cannabis, 9 patients with stimulant, 3 patients with phencyclidine, 11 patients with sedative-acting antipsychotics, 3 patients with biperiden, 32 patients with ethyl glucuronide and 22 patients with multiple drug use were excluded from the study. Persons who gave incomplete information during the interviews were not included in the study. In this way, 16 patients were excluded from the study. Patients who had comorbid first axis diagnosis, hypertension, diabetes mellitus, severe neurological, immunological or systemic diseases were excluded. In the control group, 13 people who had substance use in the past or now, 17 people who used alcohol in the past or now, 11 people who gave incomplete information or did not want to give information were excluded from the study. The group of healthy controls did not have any first axis diagnosis, hypertension, diabetes mellitus, severe neurological, immunological or systemic diseases which may affect the results. Twelve people with dull intelligence, 8 people with borderline intelligence, and 3 people with mild mental retardation were excluded from the study.

Assessment

Sociodemographic Form

A form containing sociodemographic and clinical information was filled in by the researcher. Age, gender, education level, marital status, job, family history, history of forensic prosecution, alcohol-substance type was used as variables in the questionnaire. Each variable was asked directly to the individuals and corroborated by her first-degree relative.

Symptom Checklist-90-Revised (SCL-90-R)

SCL-90-R is a 90-item self-report of subjects' symptoms and psychopathologic features on subscales: paranoid ideation (PAR), interpersonal sensitivity (I-S), hostility (HOS), psychoticism (PSY), phobic anxiety (PHOB), anxiety (ANX), somatization (SOM), depression (DEP), obsessive-compulsive (O-C), additional (AD) and general symptoms (GSI). It is a measure of the current psychological symptom status with the time reference of "last 7 days, including today". GSI is the average of 90 items. There is a scoring range from zero to four. The validity and reliability study of the Turkish version was conducted by Kılıç [10]. Kılıç [10] determined the reliability coefficients according to the subscales as follows: 0.82 for SOM; 0.84 for O-C; 0.79 for I-S; 0.78 for DEP; 0.73 for ANX; 0.79 for HOS; 0.78 for PHOB; 0.63 for PAR; 0.73 for PSY; 0.77 for AD. Half of the intermediate correlation values of SCL-90-R are above 0.61 and the other half is below 0.61. According to these findings, all values were found at $p<0.05$ level. The validity of SCL-90-R was determined by the similar scales validity method and Minnesota Multiphasic Personality Inventory (MMPI) was taken as the criterion. Pearson correlation coefficients in the two scale tools show a change between 0.50 and .59 and 0.43 median value.

Adult ADHD Self-Report Scale (ASRS-v1.1)

It is one of the scales developed by the World Health Organization (WHO) for screening mental disorders. The scale has two subscales: 'attention deficit' and 'hyperactivity/impulsivity". The questions are designed to determine how often each symptom occurs within the last six months. Answers are scored between 0-4, with 0 for never, 1 for rarely, 2 for sometimes, 3 for frequent, 4 for very frequent. Six questions form part A of the scale and the other 12 questions form part B of the scale. It was adapted to Turkish by Doğan et al. [11]. Reliability analysis showed that the Turkish version of ASRS has a high level of internal consistency (Cronbach's alpha=0.88). Cronbach's alpha coefficients for 'inattention' and 'hyperactivity/impulsivity' subscales were also high (0.82 and 0.78). Pearson product-moment correlation coefficients were revealed that the subscales and total score of the ASRS were significantly correlated with the Wender Utah Rating Scale (Pearson's correlations=0.46-0.52, $p<0.01$) and the SCL-90-R (Pearson's correlations=0.54-0.61, $p<0.01$).

Cognitive Distortions Scale (CDS)

This is a 20-item self-report, Likert type scale instrument developed by Covin et al. [12] in 2011 to measure 10 cognitive distortions (mindreading, catastrophizing, all-or-nothing thinking, emotional reasoning, labelling, mental filter, overgeneralization, personalization, should statements, minimizing the positive) using a 7-point scale (1=never, 7=all the time). Each cognitive distortion is rated in two domains: interpersonal (IP) and personal achievement (PA). It was adapted into Turkish by Özdel et al [8]. Construct validity was assessed using the Beck Depression Inventory, the State Trait Anxiety Inventory, the Dysfunctional Attitude Scale, and the Automatic Thought Questionnaire. CDS scores showed significant correlation with relevant clinical measures. Cronbach's a value were 0.933 for the CDS total, 0.871 for the IP subscale, 0.874 for the PA subscale. Item total score correlations varied 0.495 to 0.711.

Biochemical Analysis

Biochemical analysis is performed in the laboratory of our hospital by means of "instant-view multi-drug of abuse urine test kit". In our laboratory, biochemical analysis of amphetamine, barbiturate, benzodiazepine, cocaine, phencyclidine, methamphetamine, morphine, tetrahydrocannabinol and tricyclic antidepressants is performed by immuno-chromatographic methods. In these analysis findings, the minimum limit for urine; it was accepted as 500 ng/mL for "Methamphetamine" (MAMP), 50 ng/mL for cannabis agent Tetrahydrocannabinol (THC), 200 ng/mL for "Benzodiazepines" (BZD), 200 ng/mL for "Barbiturates" (BAR), 300 ng/mL for "Methadone" (EDDP), 1000 ng/mL for "Amphetamine" (AMPH), 25 ng/mL for "Phencyclidine" (PCP), 300 ng/mL for "Morphine" (OPIAT), 500 ng/mL for "Ecstasy" (MDMA), 10 ng/mL for "Acetylmorphine" (6AM), 20 ng/mL for "Bonsai" (K2-1), 10 ng/mL for "Bonsai" (K2-2), 5 ng/mL for "Buprenorphine" (BUP), 1000 ng/mL for "Ethyl Glucuronide" (EtG), and 300 ng/mL for "Cocaine" (COC). Biochemical analysis was performed to determine the presence of any substance.

Statistical analysis

Statistical analysis was performed using Windows SPSS 22.0 (Statistical Package for the Social Sciences Inc.). Diagnosis was accepted as an independent variable and scale scores were considered as dependent variables. Descriptive statistics and continuous variables were given as mean ± standard deviation, and categorical variables as frequency and percentage. Chi-square test was used to analyze categorical data. Kolmogorov-Smirnov test was used to examine the distribution of variables and independent sample test was used to evaluate continuous variables. Pearson correlation analysis was used for correlation analysis. Statistical significance level was accepted as $p<0.05$ for all values. When type 1 error is accepted as 0.05 and type 2 error is accepted as 0.20, the minimum number of subjects required to determine the power of the test as 0.80 was calculated as 4.

Results

The patient group consisted of 60 males and the control group consisted of 30 males. The mean age was 23.31±4.00 years in the patient group and 24.00±4.29 years in the control group (p=0.458). The mean duration of education was 8.20±2.12 years in the patient group, and was 8.40±2.67 years in the control group (p=0.701). The mean duration of substance use in the patient group was 55.78±34.20 months; the longest time to stay away from the substance was determined to be 14.73±20.55 months (Table 1). There was a significant difference between patient and control groups in terms of working status (p=0.011), psychiatric admission history (p<0.001), family prosecution history (p<0.001) and marital status (p=0.002). Twenty-eight (46.7%) patients had a history of hospitalization. In the patient group, the first substance used by 33 patients (55.0%) were cannabis, 14 patients (23.3%) were alcohol, 3 patients (5.0%) were opioid, 5 patients (8.3%) were inhalants, 3 patients (5.0%) were amphetamines, 2 patients (3.3%) were ecstasy. Two (3.3%) of the patients were using substance 'rarely', 20 (33.3%) were using '2-3 times a week', and 38 (63.3%) were 'almost daily'.

Table 1. Sociodemographic Data of the Patient and Control Groups

		Patient (n=60)	Control (%) (n=30)	p
Age (years)		23.31±4.00	24.00±4.29	0.458
Education (years)		8.20±2.12	8.40±2.67	0.701
Working Status	**Yes**	21 (%35.0)	19 (%63.3)	0.011*
	No	39 (%65.0)	11 (%36.7)	
Marital Status	**Married**	5 (%8.3)	11 (%36.7)	0.002*
	Single	50 (%83.3)	19 (%63.3)	
	Divorced	5 (%8.3)	0 (%0)	
Psychiatric Admission History	**Yes**	31 (%51.7)	4 (%13.3)	0.000
	No	29 (%48.3)	26 (%86.7)	
Psychiatric Application in Family	**Yes**	11 (%18.3)	5 (%16.7)	0.845
	No	49 (%81.7)	25 (%83.3)	
Substance Use in Family	**Yes**	8 (%13.3)	2 (%6.7)	0.343
	No	52 (%86.7)	28 (%93.3)	
Judicial Prosecution	**Yes**	42 (%70.0)	1 (%3.3)	0.000*
	No	18 (%30.0)	29 (%96.7)	

*p<0.05

In terms of patient subgroups, both cannabis and opioid groups consisted of 30 males. The mean age was 23.36±4.71 years in the cannabis group and 23.26±3.21 years in the opioid group (p=0.924). The mean duration of education in the cannabis group was 7.30±1.72 years and the duration of the opioid group was 9.10±2.13 years (p=0.001). The mean substance use time of the cannabis group was 43.56±31.13 months and the opioid group was 68.00±33.20 months (p=0.005). The longest period stay away from substance was 14.70±16.83 months in cannabis group and 14.76±24.00 months in opioid group (p=0.990). There was no significant difference between cannabis and opioid groups in terms of the first substances used (p=0.259) (Table 2).

Table 2. Sociodemographic Data of Cannabis and Opioid Groups

		Patient (n=60)	Control (%) (n=30)	p
Age (years)		23.36±4.71 (yıl)	23.26±3.21 (yıl)	0.924
Education (years)		7.30±1.72 (yıl)	9.10±2.13 (yıl)	0.001*
Working Status	**Yes**	15 (%50.0)	6 (%20.0)	0.015*
	No	15 (%50.0)	24 (%80.0)	
Marital Status	**Married**	4 (%13.3)	1 (%3.3)	0.353
	Single	24 (%80.0)	26 (%86.7)	
	Divorced	2 (%6.7)	3 (%10.0)	
Psychiatric Admission History	**Yes**	14 (%46.7)	17 (%56.7)	0.438
	No	16 (%53.3)	13 (%43.3)	
Psychiatric Application in Family	**Yes**	5 (%16.7)	6 (%20.0)	0.739
	No	25 (%83.3)	24 (%80.0)	
Substance Use in Family	**Yes**	0 (%0.0)	8 (%26.7)	0.002*
	No	30 (%100.0)	22 (%73.3)	
Judicial Prosecution	**Yes**	23 (%76.7)	19 (%63.3)	0.260
	No	7 (%23.3)	11 (%36.7)	
Hospitalization History	**Yes**	14 (%46.7)	14 (%46.7)	1.000
	No	16 (%53.3)	16 (%53.3)	
Frequency of Substance Use	**Rarely**	2 (%6.7)	0 (%0.0)	0.020*
	2-3 Time in a Week	14 (%46.7)	6 (%20.0)	
	Almost Every Day	14 (%46.7)	24 (%80.0)	

*p<0.05

The mean ASRS score of the patient group was 30.96±10.77, and the control group had an ASRS score of 14.66±3.67. There was a statistically significant difference between the groups (p<0.001) (Table 3). Data for SCL-90-R and its sub scores are shown in Table 3. Significant differences were found between patient and control groups in all sub-parameters such as SOM, O-C, I-S, DEP, ANX, HOS, PHOB, PAR, PSY, AD, and GSI (p<0.001).

SOM (p = 0.011) and PAR (p = 0.005) from the SCL-90-R subscales were significantly different in the cannabis and opioid group (Table 4). The mean scores of CDS-IP, CDS-PA and CDS Total were given in Table 3 and Table 4. There was a significant difference between patient-control groups and cannabis-opioid groups in terms of these three CDS sub-parameters (p<0.05).

There was a significant difference between CUD and OUD groups in terms of working status (p=0.015). The rate of working in CUD group was higher. There was no significant difference between CUD group and OUD group in terms of psychiatric admission history (p=0.438). There was no significant difference between CUD and OUD groups in terms of family history of psychiatric disorder (p=0.739). There was a significant difference between CUD and OUD groups in terms of family history of substance use (p=0.002). Family history of substance use was high in the OUD group. There was no significant difference between CUD and OUD groups in terms of forensic prosecution history (p=0.260). There was no significant difference between the CUD and OUD groups in terms of psychiatric hospitalization (p=1.000). There was no significant difference between CUD and OUD groups in terms of marital status (p=0.353). There was no significant difference between CUD and OUD groups in terms of the first substance used (p=0.259). There was a significant difference between CUD and OUD groups in terms of substance use frequency (p=0.020). The OUD group had a higher rate of substance use almost daily (Table 2).

According to correlation analysis, there were significant correlations between ASRS scores and SCL-90-R subscales. The data for the correlation analysis is shown in Table 5.

Table 3. Comparison of ASRS, CDS, SCL-90-R Between Patient and Control Groups

	Patient (n=60) (Mean±SD)	Control (n=30) (Mean±SD)	p
ASRS	30.96±10.77	14.66±3.67	0.000*
SOM	1.26±0.40	0.15±0.13	0.000*
ANX	1.46±0.32	0.21±0.10	0.000*
O-C	2.06±0.46	0.15±0.07	0.000*
DEP	1.28±0.62	0.11±0.02	0.000*
I-S	2.14±0.36	0.10±0.02	0.000*
PSY	0.68±0.32	0.00±0.00	0.000*
PAR	2.19±0.55	0.00±0.00	0.000*
HOS	2.52±0.70	0.00±0.02	0.000*
PHOB	1.09±0.34	0.01±0.04	0.000*
AD	1.01±0.35	0.15±0.07	0.000*
GSI	1.50±0.31	0.11±0.02	0.000*
CDS-IP	38.66±8.17	25.46±2.81	0.000*
CDS-PA	39.38±7.72	25.03±2.83	0.000*
CDS-T	77.88±14.95	50.50±3.55	0.000*

*p<0.05, Abbreviations: ASRS: Adult ADHD Self-Report Scale; CDS: Cognitive Distortions Scale; SCL-90-R: Symptom Checklist-90-Revised; IP: Interpersonal; PA: Personal Achievement; T: Total; SOM: Somatization; O-C: Obsessive-Compulsive; I-S: Interpersonal Sensitivity; DEP: Depression; ANX: Anxiety; HOS: Hostility; PHOB: Phobic; PAR: Paranoid; PSY: Psychotic; AD: Additional; GSI: Global Severity Index; SD: Standard Deviation

Table 4. Comparison of ASRS, CDS, SCL-90-R Values in Cannabis and Opioid Use

	Cannabis (n=30) (Mean±SD)	Opioid (n=30) (Mean±SD)	p
ANX	1.43±0.31	1.50±0.34	0.391
O-C	1.98±0.52	2.14±0.37	0.182
DEP	1.15±0.68	1.41±0.54	0.112
I-S	2.08±0.39	2.20±0.33	0.226
PSY	0.63±0.31	0.73±0.33	0.221
PAR	1.99±0.33	2.39±0.65	0.005*
HOS	2.47±0.56	2.57±0.82	0.590
PHOB	1.01±0.37	1.17±0.28	0.066
AD	0.99±0.28	1.04±0.40	0.522
GSI	1.41±0.32	1.60±0.29	0.026*
CDS-IP	41.90±7.94	35.43±7.14	0.002*
CDS-PA	42.36±7.57	36.40±6.74	0.002*
CDS-T	84.26±14.41	71.50±12.76	0.001*
Substance Use Duration (months)	43.56±31.13	68.00±33.20	0.005*
Longest Time Away from Substance (weeks)	14.70±16.83	14.76±24.00	0.990
CDS-T	77.88±14.95	50.50±3.55	0.000*

*p<0.05, Abbreviations: ASRS: Adult ADHD Self-Report Scale; CDS: Cognitive Distortions Scale; SCL-90-R: Symptom Checklist-90-Revised; IP: Interpersonal; PA: Personal Achievement; T: Total; SOM: Somatization; O-C: Obsessive-Compulsive; I-S: Interpersonal Sensitivity; DEP: Depression; ANX: Anxiety; HOS: Hostility; PHOB: Phobic; PAR: Paranoid; PSY: Psychotic; AD: Additional; GSI: Global Severity Index; SD: Standard Deviation

Table 5. Pearson Correlation Analysis Data

	Substance Use Duration (r, p)	ASRS (r, p)	GSI	CDS-IP (r, p)	CDS-PA (r, p)	CDS-T (r, p)
Substance Use Duration	1	0.285, 0.027*	0.390, 0.002**	-0.229, 0.078	-0.105, 0.425	-0.176, 0178
Longest Time Away from Substance	0.251, 0.053	-0.447, 0.000**	-0.077, 0.558	-0.006, 0.966	-0.047, 0.720	-0.036, 0.785
ASRS	0.285, 0.027*	1	0.784, 0.000**	0.547, 0.000**	0.688, 0.000**	0.636, 0.000**
SOM	0.370, 0.004**	0.782, 0.000**	0.964, 0.000**	0.601, 0.000**	0.673, 0.000**	0.649, 0.000**
ANX	0.283, 0.029*	0.766, 0.000**	0.980, 0.000**	0.629, 0.000**	0.744, 0.000**	0.707, 0.000**
O-C	0.312, 0.015*	0.805, 0.000**	0.979, 0.000**	0.644, 0.000**	0.754, 0.000**	0.722, 0.000**
DEP	0.228, 0.080	0.745, 0.000**	0.905, 0.000**	0.581, 0.000**	0.660, 0.000**	0.632, 0.000**
I-S	0.307, 0.017*	0.732, 0.000**	0.981, 0.000**	0.646, 0.000**	0.728, 0.000**	0.709, 0.000**
PSY	0.403, 0.001**	0.765, 0.000**	0.916, 0.000**	0.612, 0.000**	0.736, 0.000**	0.689, 0.000**
PAR	0.392, 0.002**	0.680, 0.000**	0.916, 0.000**	0.493, 0.000**	0.588, 0.000**	0.559, 0.000**
HOS	0.344, 0.007**	0.734, 0.000**	0.882, 0.000**	0.511, 0.000**	0.658, 0.000**	0.609, 0.000**
PHOB	0.174, 0.183	0.642, 0.000**	0.934, 0.000**	0.644, 0.000**	0.626, 0.000**	0.649, 0.000**
AD	0.197, 0.131	0.534, 0.000**	0.796, 0.000**	0.670, 0.000**	0.613, 0.000**	0.646, 0.000**
GSI	0.390, 0.002**	0.784, 0.000**	1	0.637, 0.000**	0.729, 0.000**	0.702, 0.000**
CDS-IP	-0.229, 0.078	0.547, 0.000**	0.637, 0.000**	1	0.847, 0.000**	0.957, 0.000**
CDS-PA	-0.105, 0.425	0.688, 0.000**	0.729, 0.000**	0.847, 0.000**	1	0.962, 0.000**
CDS-T	-0.176, 0.178	0.636, 0.000**	0.702, 0.000**	0.957, 0.000**	0.962, 0.000**	1

*p<0.05, **p<0.01
Abbreviations: ASRS: Adult ADHD Self-Report Scale; CDS: Cognitive Distortions Scale; SCL-90-R: Symptom Checklist-90-Revised; IP: Interpersonal; PA: Personal Achievement; T: Total; SOM: Somatization; O-C: Obsessive-Compulsive; I-S: Interpersonal Sensitivity; DEP: Depression; ANX: Anxiety; HOS: Hostility; PHOB: Phobic; PAR: Paranoid; PSY: Psychotic; AD: Additional; GSI: Global Severity Index

Discussion

Our study shows that cannabis and heroin use is associated with different levels of cognitive error. According to our findings, cannabis use is associated with more cognitive errors than heroin use.

It is thought that individuals diagnosed with SUD have problems in working life and that these problems may have arisen due to some reasons such as personality traits and functional impairment of the substance [13-15]. In our study, it was found that patients with SUD were less likely to have a regular job compared to the control group. Evren et al. [16] reported that 46.5% of people with CUD were unemployed. Forensic problems were found to be significantly higher in SUD cases and similar findings were found in the literature. Altuner et al. [17] found a positive correlation between drug use and crime. Ögel et al. [18] reported that 64% of drug users had problems with the law and half of them had prison experience. Numerous studies have reported a high incidence of comorbid psychiatric disorders in children and adolescents diagnosed with SUD [19]. In our study, psychiatric symptoms were found to be significantly higher in the SUD group than in the control group. In the SUD group, HOS, PAR and I-S symptoms were found to be the highest scores. Herken et al. [20] reported that the most affected area in SCL-90-R was HOS and PAR in alcohol users. The relationship between SUD and ADHD has long been known. Therefore, it is important to determine the severity of ADHD in individuals with SUD or to question the substance use in people with ADHD. In this study, ADHD diagnosis was not investigated. Only ADHD symptoms were determined through ASRS. Psychoeducation and, in some cases, psychostimulant treatment for ADHD symptoms in persons with substance use increase their functionality [21, 22]. In our study, it was seen that individuals diagnosed with SUD had more ADHD symptoms than the control group. Ozturk and Akay [23] stated that the risk of developing SUD increases significantly in individuals with ADHD. Özen et al. [5] showed that 32.47% of individuals with SUD meet ADHD diagnostic criteria.

The main purpose of this study was to determine the relationship between cannabis and opioid use and cognitive symptoms. Accordingly, opioid use was more related to unemployment than cannabis use. This was thought to be related to the general characteristics of opioid and its effects on the body. Cognitive impairment, deterioration in executive functions, deterioration in decision-making and risk-taking behaviors, deterioration in reward and motivation mechanisms, deterioration in processing speed and visual-spatial abilities are observed due to opioid use [24]. Deprivation and substance-seeking behavior are more pronounced in opioid use than in cannabis use. Due to these characteristics, it may further impair functionality in relation to the working status. It was thought that opioid group was riskier than cannabis group because of these characteristics [2].

There were some differences between the two types of illicit substances in terms of psychiatric symptoms. Accordingly, the SOM score of the SCL-90-R subscales was found to be higher in the opioid group. Opioid use and abstinence present with higher levels of physical symptoms than cannabis use in the body. For example, opioid deprivation causes symptoms such as sweating, chills, fever, dyspepsia, vomiting, joint pain, and muscle spasms [2, 24]. It was thought that these symptoms may have caused the SOM score to be higher in the opioid group. The severity of somatic symptoms varies as a function of the half-life of the opioid, the duration of opioid use, and patient-specific characteristics including health status. Abrupt cessation of short-acting opioids such as heroin is associated with severe symptoms. Extending the withdrawal period through buprenorphine has an important role in treatment [25]. PAR score was also more correlated with opioid. The opioid group had a higher substance use time than the cannabis group. It is also known that opioid users initially use cannabis for a while and then start using opioids [2]. When this information is evaluated together, it can be understood why PAR score is higher in opioid group. The most important reason for this was thought to be longer exposure to the illicit substance. Our results were also consistent with previous literature on youths with paranoid personality traits predicting tobacco dependence and hard drug use. Indeed, characteristics of paranoid personality pattern include hypersensitivity, suspiciousness, and mistrust of others. All these symptoms induce an unpleasant state of internal tension. It is thus possible that patients with paranoid personality traits use substances in order to decrease this state of internal tension [26].

CDS is a scale that examines personal accomplishments with social relations and thus enables us to get information about the most important areas of life. CDS is Likert type and has a wide score range from 1 to 7, thus allowing us to reach more realistic results [12]. Örüm et al. [2] reported that all three CDS parameters in the SUD group were more impaired in the patient group than in the control group. Our study is valuable in that it shows the relationship between this disorder and substance types with a higher sample size. According to our study, all three CDS parameters were more impaired in cannabis group than opioid group. Depending on the use of cannabis, new episodic memory coding disorder, psychotic symptoms, risk-taking behavior and decision-making disorders, process memory problems, abnormalities in the endocannabinoid system, which play an important role in neuronal development, are observed [27, 28]. The higher incidence of cognitive errors in CUD was thought to be related to these characteristics of cannabis. Volkow et al. [29] stated that cannabis use causes acute impairment of learning and memory, attention, and working memory. Case control studies comparing non-intoxicated heavy cannabis users with nonusers have consistently shown that heavy cannabis users perform worse on neuropsychological tests [29]. According to Saban et al. [30], cannabis use was associated with a higher rate of psychopathology than opioid use. However, there are studies reporting a similar effect on cognition among cannabis and opioid users [2]. Differences in the sample size and substance use characteristics were thought to have caused different results. Another possible reason of the difference between the two groups in terms of cognitions in our study is the cognitive structure of these people in the period before substance use. It is not possible to explain whether the effect of cannabis and opioid on cognition is due to the cognitive structure prior to substance use or to disorders caused by substance use.

According to the correlation analysis, the positive correlation between the ASRS score and SCL-90-R subscales is remarkable. On the other hand, a positive correlation was found between substance use duration and psychotic, paranoid, anger subscale scores of SCL-90-R. As the psychiatric symptoms increased, the rate of detection of cognitive error also increased [5].

Conclusion

In conclusion, this study examines the cognitive errors of cannabis and opioid users by means of the CDS. According to our study, cannabis use is associated with more cognitive errors than opioid use. Possible reasons for this - effect of cannabis, cognitive structure prior to substance use, or both of them- are important topics to be investigated.

Despite the significant findings in our study, there are several limitations. There is a need to increase the sample size and carry out studies including female gender in the future. Potential substance use that cannot be determined in toxic screening in urine is another limitation. More information about ADHD can be provided. It may be possible to evaluate the results better by increasing the scale diversity, expanding sociodemographic data, and detailed substance use history. It is not possible to generalize the results because of locality of sample. All scales are self-report scales.

Competing interests
We declare that we have no conflict of interest.

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Ethical approval
The targeted age was between 15-65 years. Local ethics committee approval was obtained, and all study participants provided written informed consent (2019/8-16).

References

1. Dregan A, Gulliford MC. Is illicit drug use harmful to cognitive functioning in the midadult years? A cohort-based investigation. Am J Epidemiol. 2012;175(3):218-27.

2. Örüm MH, Kara MZ, Kuştepe A, et al. Bilişsel hatalar ve dikkat-eksikliği hiperaktivite bozukluğu belirtilerinin madde kullanım özellikleri ile ilişkisi. Bağımlılık Dergisi–Journal of Dependence. 2019;20(2):47-60.

3. Orum MH, Kustepe A, Kara MZ, et al. Addiction profiles of patients with substance dependency living in Adiyaman province. Medicine Science. 2018;7(2):369-72.

4. Kaya-Bozkurt E, Çelik M, Kalenderoğlu A, et al. Autistic symptoms in children with attention deficit hyperactivity disorder. The Journal of Neurobehavioral Sciences. 2019;6(1):6-11.

5. Ozen ME, Orum MH, Kalenderoglu A, et al. Attention-deficit/hyperactivity disorder in patients attending remedial treatment due to substance use disorder in Adiyaman University Training and Research Hospital. Psychiatry and Behavioral Sciences. 2018;8(2):57-62.

6. Kustepe A, Kalenderoglu A, Celik M, et al. Evaluation of impulsivity and complex attention functions of subjects with substance use: Sample from Adiyaman province. Medicine Science. 2019;8(1):67-71.

7. Wang K, Xu M, Ji Y, et al. Altered social cognition and connectivity of default mode networks in the co-occurrence of autistic spectrum disorder and attention

deficit hyperactivity disorder. Aust N Z J Psychiatry. 2019:4867419836031.

8. Özdel K, Taymur I, Guriz SO, et al. Measuring cognitive errors using the cognitive distortions scale (CDS): Psychometric properties in clinical and non-clinical samples. PLoS ONE. 2014;9:e105956.

9. American Psychiatric Association. Diagnostic and statistical manual of mental disorders 5th edition. Washington, DC: Author. 2013.

10. Kılıç M. Belirti Tarama Listesi (SCL-90-R)'nin geçerlilik ve güvenirliği. Psikolojik Danışma ve Rehberlik Dergisi. 1991;1:45-52.

11. Doğan S, Öncü B, Varol-Saraçoğlu G, ve ark. Erişkin Dikkat Eksikliği Hiperaktivite Bozukluğu Kendi Bildirim Ölçeği (ASRS-v1.1): Türkçe formunun geçerlilik ve güvenilirliği. Anadolu Psikiyatri Dergisi. 2009;10:77-87.

12. Covin R, Dozois DJA, Ogniewicz A, et al. Measuring cognitive errors: Initial development of the Cognitive Distortions Scale (CDS). Int J Cogn Ther. 2011;4:297-322.

13. Ögel K. Madde kullanım bozuklukları epidemiyolojisi. Turkiye Klinikleri J Int Med Sci. 2005;1:61-64.

14. Egilmez OB, Örüm MH, Dumlupınar E, et al. Denetimli serbestlik uygulaması kapsamında yapılan başvuruların geriye dönük olarak değerlendirilmesi: 2018 yılı verileri. Bağımlılık Dergisi – Journal of Dependence. 2019;20:80-7.

15. Orum MH, Kara MZ, Egilmez OB, et al. Evaluation of probation implementations of drug users in Adiyaman university training and research hospital: A one-year retrospective study. Medicine Science. 2018;7:754-8.

16. Evren EC, Ögel K, Çakmak D. Esrar ve meperidin (Petidin) kullanım bozukluğu nedeni ile yatarak tedavi gören hastaların özeliklerinin karşılaştırılması. Anadolu Psikiyatri Dergisi. 2002;3:20-27.

17. Altuner D, Engin N, Gürer C, et al. Madde kullanımı ve suç ilişkisi: kesitsel bir araştırma. Tıp Araştırmaları Dergisi. 2009;7:87-94.

18. Ögel K, Tamar D, Evren C, et al. Madde kullanıcılarının özellikleri: Gözden geçirme. Psikiyatri Psikoloji Psikofarmakoloji (3P) Dergisi. 1999;7:5-32.

19. Welsh JW, Knight JR, Hou SS, et al. Association between substance use diagnoses and psychiatric disorders in an adolescent and young adult clinic-based population. J Adolesc Health. 2017;60:648-52.

20. Herken H, Bodur S, Kara F. Üniversite öğrencisi kızlarda madde kullanımı ile kişilik ve ruhsal belirti ilişkisi. Klinik Psikiyatri. 2000;3:40-5.

21. De Crescenzo F, Cortese S, Adamo N, et al. Pharmacological and non-pharmacological treatment of adults with ADHD: a meta-review. Evid Based Ment Health. 2017;20:4-11.

22. Egilmez OB, Örüm MH, Kara MZ. Adıyaman ili AMATEM verilerinin geriye dönük olarak incelenmesi: 2018 yılı verileri. Bağımlılık Dergisi-Journal of Dependence. 2019;20:88-96.

23. Ozturk Y, Akay A. Attention deficit hyperactivity disorder and substance use disorders. Turkiye Klinikleri Child Psychiatry-Special Topics. 2015;1:64-7.

24. Benich JJ 3rd. Opioid dependence. Prim Care. 2011;38:59-70.

25. Kosten TR, O'Connor PG. Management of drug and alcohol withdrawal. New Engl J Med. 2003;348:1786-95.

26. Trull TJ, Waudby CJ, Sher KJ. Alcohol, tobacco, and drug use disorders and personality disorder symptoms. Exp Clin Psychopharmacol. 2004;12:65-75.

27. Curran HV, Freeman TP, Mokrysz C, et al. Keep off the grass? Cannabis, cognition and addiction. Nat Rev Neurosci. 2016;17:293-306.

28. Özen ME, Örüm MH, Kalenderoğlu A. Hot shower therapy in cannabinoid hyperemesis syndrome: A case report. FNG & Bilim Tıp Dergisi. 2018;4:142-4.

29. Volkow ND, Swanson JM, Evins AE, et al. Effects of cannabis use on human behaviour, including cognition, motivation, and psychosis: A review. JAMA Psychiatry. 2016;73:292-7.

30. Saban A, Flisher A, Laubscher R, et al. The association between psychopathology and substance use: adolescent and young adultsubstance users in inpatient treatment in Cape Town, South Africa. Pan Afr Med J. 2014;17:8.