

A Comparative Study of Women With Substance Use Disorder With and Without Post-traumatic Stress Disorder: Complex Interaction Between Childhood Trauma, Empathy, Personality Traits, and Substance Use Severity

ABSTRACT

Objective: Substance use disorders (SUDs) and post-traumatic stress disorder (PTSD) significantly coexist; thus, identifying potential related factors of both illnesses is important for advancing the prevention strategies. The goals of this study were to compare women with SUD with and without PTSD in terms of potentially related variables and to investigate if those factors are associated with SUD severity.

Methods: Ninety-five participants (women) with SUD who had been admitted to the outpatient treatment clinic in Turkey were assessed with borderline personality questionnaire, childhood trauma questionnaire, addiction profile index, Levenson self-report psychopathy questionnaire, and basic empathy scale.

Results: Participants with PTSD had significantly higher severity of addiction, childhood trauma, borderline personality traits, secondary psychopathy scores, and affective empathy scores than participants without PTSD ($P=.013$, $P=.012$, $P=.008$, $P=.031$, $P=.040$).

Conclusion: Our study suggested that comorbid PTSD and SUD resulted in more complicated presentation. It seems to be crucial for practitioners to screen PTSD symptoms in women with severe SUD and complicated clinical presentations.

Keywords: Post-traumatic stress disorder, substance, personality, borderline, psychopathy

Introduction

Substance use disorder (SUD) has significant associations with post-traumatic stress disorder (PTSD), such that individuals with PTSD have been reported to have higher risk of SUD than those without PTSD.¹ Epidemiological studies show that among those with SUD, 80% have had exposure to a traumatic event, and 30%-60% have had a lifetime diagnosis of PTSD.² Higher rates of substance use are observed in adolescents and young adults who have been exposed to child sexual abuse or physical abuse and also in disaster-exposed and trauma treatment-seeking samples.³

Several hypotheses explaining the co-occurrence of SUD and PTSD have been postulated. The hypothesis with the most empirical support posits that individuals with PTSD use substances to minimize the distressing PTSD symptoms.⁴ Additional avoidant coping strategies have been reported in patients with SUD and PTSD with higher relapse rates.^{5,6}

Other potential connections between PTSD and SUD include the high-risk and susceptibility hypotheses. The high-risk hypothesis speculates that high-risk activities, which may frequently occur in SUDs, increase the risk to traumatic events. The susceptibility hypothesis states that substance users may be more susceptible to PTSD due to impairment of neural circuits involving the amygdala that results from extensive substance use.⁷



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Received: April 20, 2023

Accepted: September 16, 2023

Publication Date: October 24, 2023

Cite this article as: Karabulut S, Genç H. A comparative study of women with substance use disorder with and without PTSD: Complex interaction between childhood trauma, empathy, personality traits and substance use severity. *Alpha Psychiatry*. 2023;24(5):226-233.



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Women with lifetime sexual victimization and other traumas may be more likely than men to use substances to cope with PTSD symptoms.⁸ A study of inpatients with SUD reported that 69% of those women had a history of lifetime substance abuse.⁹ In line with this finding, women with both PTSD and SUD have been associated with greater drug use problems, greater trauma-related drug craving, higher frequency of relapse, and poorer treatment compliance.¹⁰

Empathy, a multidimensional construct that includes cognitive and affective domains, is the ability to recognize the emotions of others and the ability to feel another's feelings.¹¹ The relation between PTSD symptom severity and sociocognitive deficits has been reported in previous studies.^{12,13} Trauma survivors have significant impairments in specific domains of empathic responding. Despite the fact that studies that evaluated performance on empathic processing measures across individuals with PTSD and healthy controls had mixed results, lower cognitive empathy scores and higher affective empathy scores were reported among individuals with PTSD.^{12,13,14} Moreover, during the course of SUD, dysfunctional social cognition and interaction become more prominent. Drug-induced changes in those abilities were hypothesized to contribute to alterations in social interactions, thereby leading to social withdrawal and maintained substance use.¹⁵ However, the data on the relation between empathy and SUD severity seem controversial. Previous studies revealed that earlier first use of a substance, chronic use, and polysubstance use correlated with impairment.^{16,17} On the other hand, several studies showed no correlation between drug use intensity and sociocognitive deficits.^{18,19}

Borderline personality disorder (BPD) is reported to be seen in 2% of the general population. Studies revealed that this disorder is 3 times more common in women than men.²⁰ The most frequent comorbid disorders in BPD patients are anxiety disorders (85%) including PTSD followed by substance-related disorders (with a lifetime prevalence of 78%). Overall, the probability of occurrence of SUD is 10 times higher among BPD patients than in the general population.²¹ An attempt to mitigate emotions perceived as overwhelmingly negative or to replace these by a pleasant state might be the underlying cause of substance use in BPD patients.²² A study from Norway reported that female polysubstance abusers had higher rates of comorbid PTSD and BPD; whereas male polysubstance abusers had higher comorbidity of antisocial personality disorder (ASPD).²³ Psychopathy was found to be related with chronic use, lower treatment retention, and higher severity of SUD. Studies investigating the causality between BPD and PTSD suggested a common etiology for both disorders based on finding associations between childhood traumas.^{24,25}

On the other hand, gender-related factors might contribute to difficulties in perceived need and treatment access. Gender-related

barriers often contribute to the insufficient treatment of women with SUD, including stigmatization, childcare issues, and family responsibilities.²⁶ Stigma was reported in relation with lower empowerment, self-efficacy, social support, treatment compliance, and higher symptom severity.²⁷ Thus, women with co-occurring disorders choose to enter general psychiatry clinics rather than addiction treatment units.²⁸ Women were also reported to be at risk of underdiagnosis. Besides, women with SUD in Eastern countries may have more cultural barriers and stigma than women in Western countries. Potential barriers to treatment include (a) the belief that substance use in women may corrupt moral values of society and (b) a lack of specialized treatment clinics. Also, women may fear losing their child if they seek help.²⁹

Given the stigma and potential barriers to receiving treatment for Turkish women, it may be particularly difficult to identify PTSD prevalence, its relation with childhood trauma history, personality traits, empathy, and substance-use characteristics in a specialized substance use population. Although aforementioned relations had been studied repeatedly, to the best of our knowledge, there has been no previous study investigating SUD women's clinical variables in Turkey.

Given the bidirectional relation between trauma and SUD in women, we hypothesized that patients with PTSD would have higher rates of childhood trauma scores, borderline personality questionnaire (BPQ) scores, substance-use severity, and impairments in empathy.

Materials and Methods

Participants and Procedures

Our study was planned as cross-sectional, and patients were enrolled from Antalya Atatürk State Hospital outpatient (addiction) treatment clinic (OTC), Turkey. Participants were women who were admitted to OTC consecutively between September 2021 and August 2022. All participants were screened with Diagnostic and Statistical Manual of Mental Disorders, 5th Edition (DSM-5) Structured Clinical Interview for DSM/Clinician Version (SCID/CV) for SUD except tobacco products.³⁰ Totally, 104 participants who had applied to OTC were considered for the study. Three patients were excluded due to illiteracy, 5 patients were excluded due to substance use shorter than 12 months, and 1 patient was excluded due to gambling disorder diagnosis. A total of 95 women patients who were diagnosed with at least 1 SUD participated in the study.

A semistructured questionnaire and clinical scales were administered face to face by the researcher at the clinic. Comorbidity with alcohol use disorder, psychotic disorders, intellectual disability, illiteracy, or unwillingness to participate in the study were exclusion criteria. Patients who had severe suicidal or homicidal thoughts during the interview were also excluded from the study.

This study protocol was approved by the Ethics Committee of Antalya Research and Training Hospital (Approval No: 8/13, Date: September 23, 2021). Written informed consent was obtained from the participants who agreed to take part in the study.

Measures

Demographics: Demographics measured included age, sheltering, insurance, income, employment, schooling and relationship status,

MAIN POINTS

- Comorbidity of post-traumatic stress disorder (PTSD) and substance use disorder (SUD) resulted in a more complicated presentation in women admitted to the addiction center.
- Empathic responding, especially affective empathy, might be a junction point for women with PTSD, borderline personality disorder, and SUD.
- Rate of childhood traumas, especially sexual abuse, was significantly higher in women with PTSD–SUD relative to those without PTSD.

past treatment history, history of imprisonment, and parole/probation.

Characteristics of Clinical Features: Frequency and amount of tobacco use, frequency of alcohol use, screening for infectious diseases (hepatitis B virus, hepatitis C virus, human immunodeficiency virus, and Venereal Disease Research Laboratory- *Treponema Pallidum* Haemagglutination), body mass index (BMI), suicide attempts in the past, intravenous (IV) drug use and drug equipment sharing, risky sexual behavior (sexual intercourse with commercial sex workers or multiple partners and unprotected sexual intercourse), reasons for first drug experience, age of first drug use, first-degree relatives' history of alcohol, substance use and behavioral addictions, and number of drugs used within last year were all evaluated during the interview with patients.

Clinical Scales: Addiction profile index (API) was used for evaluating the severity of addiction. Addiction profile index contains 37 items and 5 subscales, which are rated by the assessor on separate 3-point scales. The subscales measure the characteristics of substance use, dependency diagnosis, the effect of substance use on the person's life, craving, and the motivation for quitting using substances.³¹ A high score obtained from this scale shows the high severity of SUD.

As a diagnostic instrument, the Structured Clinical Interview for DSM-5 Disorders-Clinician Version (SCID-5-CV) PTSD section and SUDs section were administered. The SCID-5-CV, released in 2014, is a clinician-administered interview for screening diagnoses using the DSM-5, which consists of 10 modules for 39 diagnoses and allows screening for an additional 16 diagnoses.³⁰ The scale was found to be valid in the Turkish population.³²

To assess the severity of PTSD, The PTSD Checklist for DSM-5 (PCL-5) was used. It includes 20 self-report items based on the DSM-5 symptoms of PTSD. Respondents report how much they were bothered by a symptom over the past month using a 5-point Likert scale. Total score can range from 0 to 80.³³ A high score of this scale indicates the high severity of PTSD symptoms.

Symptoms and severity of borderline personality traits were evaluated using the BPQ. The BPQ is an 80-item true/false self-report measure which was designed according to the 9 DSM-IV BPD criteria. These are grouped as impulsivity (9 items), affective instability (10 items), abandonment (10 items), unstable relationships (8 items), self-image (9 items), self-mutilation (7 items), emptiness (10 items), intense anger (10 items), and quasi-psychotic states (7 items).^{34,35} When the total score is high, it indicates the high severity of borderline personality traits.

Levenson Self-report Psychopathy Scale (LSRP) is a 26-item self-report measure designed to evaluate both the behavioral and personality traits commonly associated with psychopathy. Each item consists of a statement which the participant reads and then endorses on a 4-point scale. A factor analysis revealed that primary psychopathy (first factor) measures a callous/manipulative interpersonal style, while secondary psychopathy (second factor) contains items associated with behavioral problems.³⁶

Empathy was assessed via the Basic Empathy Scale which uses a 5-point Likert response scale ranging from 1 (totally disagree) to 5

(totally agree). The scale contains 20 items: 11 items focused on affective empathy and 9 items focused on cognitive empathy.^{37,38} The lowest score that can be obtained from the cognitive empathy subscale is 9, and the highest score is 45. For the emotional empathy subscale, the lowest score that can be obtained from the scale is 11, and the highest score is 55. High scores obtained from the scale indicate high levels of empathy.

The Childhood Trauma Questionnaire-28 is a self-reported, Likert-type scale that assesses mistreatment in childhood (age < 20 years) in 5 domains, including emotional, physical, and sexual abuse and physical and emotional neglect. It also involves 3 additional questions that assess minimization or denial. The latter questions were included to achieve more accurate assessment of results. The questions are rated by a 5-point Likert scale as follows: 1, never true; 2, rarely true; 3, sometimes true; 4, often true; and 5, very often true. While scoring, scores from positive statements are inverted. The individual items are summed to obtain subscales from 5 to 25 points. The total score ranges from 25 to 125 points.^{39,40}

Statistical Analysis

All statistical analyses were performed via Statistical Package for the Social Sciences Statistics software, version 26.0 (IBM SPSS Corp.; Armonk, NY, USA), and descriptive statistics for all categorical and continuous variables were included. Descriptive statistics were presented (minimum–maximum) as median for non-normally distributed variables and mean and SD for the normally distributed variables. Categorical variables were reported as frequencies and percentages. Pearson chi-square test was run to examine the differences between categorical variables. Pearson chi-square test, Fisher's exact test, and Fisher–Freeman–Halton test were run to examine the differences between categorical variables. Normality was assessed by Kolmogorov–Smirnov and Shapiro–Wilk tests. The independent sample *t*-test was used for normally distributed continuous variables and the Mann–Whitney *U*-test was used for non-normally distributed continuous variables. The significance level was established as $\alpha = 0.05$.

Results

Characteristics of the Sample Demographics

Among the participants, 82 (86.3%) were living with family/partner, 75 (78.9%) were health insurers, 71 (74.7%) had no income, and 80 (84.2%) were unemployed. In terms of education level, 50 (52.6%) were secondary school graduates, 28 (29.5%) were high school graduates, 9 (9.5%) were primary school graduates, and 8 (8.4%) were university graduates. In terms of relationship, 38 (40%) were separated/divorced, 29 (30.5%) were single, and 28 (29.5%) had a partner. The mean age was 26 (6.2%) (data not shown).

Characteristics of Clinical Features

Among participants, 35 (36.8%) had never been admitted to OTC before. The majority of the group had voluntarily been admitted (75.8%). Twenty-six (27.4%) had imprisonment history, and 40 (42.1%) had parole/probation history. In terms of suicide, 52 (54.7%) had attempted suicide in the past, and the mean number of suicide attempts was 1.69 (2.6%).

Ninety-two (96.8%) of the patients were tobacco-product smokers, and 33 (34.7%) were social alcohol drinkers. The rates of

poly-SUD and opiate use disorder were similar among patients (34.7%, each). The second most frequent diagnosis was stimulant (methamphetamine) use disorder (23.2%). Evaluating the first substance use, cannabis was the most used substance (50.5%), peer influence was the most frequent motive (44.2%). Forty (42.1%) had substance or alcohol use disorder history in the first-degree relatives. Thirty-six (37.9%) of the patients had a diagnosis of PTSD.

Twenty-five (26.3%) were lifetime IV drug users, and 15 (15.8%) had shared syringes or IV drug use equipment. Twenty-three (24.2%) had a contagious disease history, and 30 (31.6%) had risky sexual behavior recently (data not shown).

Sociodemographic Differences Between Groups With Post-traumatic Stress Disorder and Without Post-traumatic Stress Disorder

There were no differences between PTSD+ and PTSD– groups with regard to age [26 (SD=5.8) vs. 25.6 (SD=6.3)], “living with” status (83.3% vs. 88.7%), schooling (55.6% vs. 54.7%), income status (80.6% vs. 81.1%), relationship status (38.9% vs. 41.5%), and employment (83.3% vs. 83%) (Table 1).

Clinical Differences Between Groups With Post-traumatic Stress Disorder and Without Post-traumatic Stress Disorder

Rates of admission to OTC in the past, having been on probation, imprisonment history, alcohol use, lifetime IV drug use, risky sexual behavior, and family history of alcohol/SUD were not significantly different between groups, whereas the mean number of suicide attempts was higher in group with PTSD [2 (SD=2.49) vs. 1.3 (SD=2.64), *P*=.048].

Table 1. Comparison of Demographics Between Post-traumatic Stress Disorder-Positive and -Negative Groups

	PTSD+ n (%)	PTSD– n (%)	<i>P</i>
Living with			.535
Family/partner	30 (83.3)	47 (88.7)	
Alone	6 (16.7)	6 (11.3)	
Income status			.946
Low income (<15 000 Turkish liras/month)	29 (80.6)	43 (81.1)	
High income (>15 000 Turkish liras/month)	7 (19.4)	10 (18.9)	
Work status			.565
Unemployed	30 (83.4)	44 (83)	
Temporary/part-time	3 (8.3)	2 (3.8)	
Employed	3 (8.3)	7 (13.2)	
Schooling			.995
Secondary school (8 years)	20 (64.5)	29 (64.4)	
High school (12 years)	11 (35.5)	16 (35.6)	
Relationship			.641
Divorced/separated	14 (38.9)	22 (41.5)	
Single	10 (27.8)	18 (34)	
Married/living with a partner	12 (33.3)	13 (24.5)	
	Mean (SD)	Mean (SD)	
Age	26 (SD=5.8)	25.6 (SD=6.3)	.777

n, number of samples; PTSD, post-traumatic stress disorder.

There were no significant differences between groups in terms of number of substances used last year and BMI (kg/m²). However, the total amount of tobacco smoked was higher in the group with PTSD [13.4 (SD=9.9) vs. 9.5 (SD=8.83) (pack/year), *P*=.032] (Table 2).

Table 2. Comparison of Clinical Features Between Post-traumatic Stress Disorder-Positive and -Negative Groups

	PTSD+ n (%)	PTSD– n (%)	<i>P</i>
Admission to OTC in the past			.460
Yes	21 (58.3)	35 (66)	
None	15 (41.7)	18 (34)	
Parole/probation history			.440
Yes	14 (38.9)	25 (47.2)	
None	22 (61.1)	28 (52.8)	
Alcohol use			.260
None	24 (66.7)	29 (54.7)	
Social drinker	12 (33.3)	24 (45.3)	
Lifetime intravenous drug use			.852
None	25 (73.5)	38 (71.7)	
Yes	9 (26.5)	15 (28.3)	
Risky sexual behavior			.901
None	24 (66.7)	36 (67.9)	
Yes	12 (33.3)	17 (32.1)	
Suicide attempt			.084
Yes	23 (63.9)	24 (45.3)	
None	13 (36.1)	29 (54.7)	
Family history of alcohol/substance use disorder			.333
Yes	18 (50)	21 (39.6)	
None	18 (50)	32 (60.4)	
Mediator of first substance experience			.122
Peer influence/pressure	12 (33.3)	29 (55.8)	
Family (parent/sibling/partner use)	7 (19.4)	4 (7.7)	
Sensation seeking	11 (30.6)	10 (19.2)	
Relievement of psychiatric symptoms (depression/anxiety/trauma, etc.)	6 (16.7)	9 (17.3)	
Type of substance use disorder			.307
Polysubstance use disorder	16 (47)	16 (33.3)	
Opiate use disorder	13 (38.2)	19 (39.5)	
Stimulant use disorder (methamphetamine)	5 (14.8)	13 (27.2)	
	Mean (SD)	Mean (SD)	
Age of first substance experience	17 (SD=4.1)	18.3 (SD=5.2)	.229
	Median (Minimum–Maximum)	Median (Minimum–Maximum)	
Amount of tobacco products used (pack/year)	11 (1.5-37.5)	8 (0-42)	.032
Number of suicide attempts	1 (0-12)	0 (0-15)	.048
Number of substances used within last year	2 (1-5)	2 (1-6)	.753
Body mass index (kg/m ²)	20.48 (16.23-30.12)	19.99 (12.44-41.52)	.420

n, number of samples; OTC, outpatient treatment clinic; PTSD, post-traumatic stress disorder.

The most preferred first substance experienced was cannabis in both groups. The mean age of first substance use was not different between groups. Peer influence was the most frequent mediator of first experience.

In terms of addiction severity, PTSD+ patients had higher total API scores and substance-use subscale scores than did PTSD- patients [6.82 (SD=0.9) vs. 6 (SD=1.73), $P=.013$; 1.29 (SD=1.07) vs. 0.87 (SD=0.83), $P=.041$, respectively], whereas other subscales of API showed no significant difference between PTSD+ patients and PTSD- patients.

Borderline personality trait scores and total BPQ scores were higher in the PTSD+ group than in the PTSD- group [affective instability: 7.15 (SD=2.09) vs. 5.41 (SD=2.42), $P=.004$; abandonment: 6.77 (SD=2.17) vs. 4.71 (SD=2.19), $P<.001$; self-image: 4.96 (SD=2.6) vs.

3.68 (SD=2.46), $P=.047$; emptiness: 7.04 (SD=2.42) vs. 5.1 (SD=2.26), $P=.001$; BPQ score: 49.7 (SD=14) vs. 39.8 (SD=14.5), $P=.008$].

Secondary psychopathy subscale scores were higher in the group with PTSD than in the PTSD- group [29.7 (SD=5.9) vs. 26.7 (SD=5.2), $P=.031$]; however, primary psychopathy and total LSRP scores showed no significant difference.

Affective empathy subscale scores were higher in the PTSD+ group than in the PTSD- group [41.3 (SD=7) vs. 37.7 (SD=6.5), $P=.040$]. Although all the CTQ subscales were higher in PTSD+ group, only the emotional and sexual abuse scores were significantly different [12.8 (SD=4.7) vs. 10.4 (SD=5.6), $P=.040$; 11.6 (SD=6.8) vs. 7.61 (SD=4.41), $P=.006$, respectively]. Total CTQ scores were also found to be significantly higher in the PTSD+ patients [58.8 (SD=20.3) vs. 46.9 (SD=17.7), $P=.012$] (Table 3).

Table 3. Comparison of Clinical Scales Between Post-traumatic Stress Disorder-Positive and -Negative Groups

	PTSD+ n (%)	PTSD- n (%)	P
Severity of psychopathy			.981
Psychopathic	16 (57.1)	23 (54.8)	
Not psychopathic/mixed	12 (42.9)	19 (45.2)	
	Mean (SD)	Mean (SD)	
API total score	6.82 (SD=0.97)	6 (SD=1.73)	.013
API dependency diagnosis subscale score	8.87 (SD=2.43)	7.88 (SD=3.34)	.132
API craving subscale score	4.91 (SD=1.93)	4.15 (SD=2.16)	.091
Impulsivity subscale score	4.08 (SD=1.76)	3.9 (SD=1.62)	.680
Self-image subscale score	4.96 (SD=2.6)	3.68 (SD=2.46)	.047
Abandonment subscale score	6.77 (SD=2.17)	4.71 (SD=2.19)	<.001
Emptiness subscale score	7.04 (SD=2.42)	5.1 (SD=2.26)	.001
BPQ total score	49.7 (SD=14)	39.8 (SD=14.5)	.008
Primary psychopathy subscale score	28.4 (SD=8.2)	31.1 (SD=6.4)	.132
Secondary psychopathy subscale score	29.7 (SD=5.9)	26.7 (SD=5.2)	.031
LSRP total score	58.1 (SD=12.1)	57.9 (SD=9.6)	.917
Cognitive empathy subscale score	35.7 (SD=6.4)	34.8 (SD=4.7)	.544
Affective empathy subscale score	41.3 (SD=7)	37.7 (SD=6.5)	.040
BES total score	77 (SD=11)	72.6 (SD=9)	.082
Emotional neglect subscale score	15.2 (SD=5.3)	13.4 (SD=5.4)	.171
CTQ total score	58.8 (SD=20.3)	46.9 (SD=17.7)	.012
	Median (Minimum–Maximum)	Median (Minimum–Maximum)	
API the effect of substance use on the person's life subscale score	16 (7-20)	15 (2-19)	.070
API motivation for quitting using substance subscale score	6 (3-6)	6 (0-6)	.592
API substance use subscale score	1.18 (0-4.72)	0.36 (0-2.45)	.041
Affective instability subscale score	8 (2-10)	5 (1-10)	.004
Unstable relationships subscale score	6 (1-8)	5 (1-8)	.080
Intense anger subscale score	8 (0-10)	7 (0-10)	.224
Self-mutilation subscale score	4 (0-6)	3 (0-7)	.152
Quasi-psychotic states subscale score	4 (0-7)	3 (0-7)	.428
Physical abuse subscale score	7 (5-24)	5 (5-17)	.130
Emotional abuse subscale score	12 (5-21)	9 (5-23)	.040
Physical neglect subscale score	8.5 (5-20)	8 (5-18)	.139
Sexual abuse subscale score	10 (5-25)	5 (5-24)	.006
PCL-5 total score	65.5 (23-80)	52 (11-80)	.002

API, addiction profile index; BES, basic empathy scale; BPQ, borderline personality questionnaire; CTQ, childhood trauma questionnaire; LSRP, Levenson self-report psychopathy scale; n, number of samples; PCL-5, post-traumatic stress disorder checklist for Diagnostic and Statistical Manual of Mental Disorders, 5th Edition; PTSD, post-traumatic stress disorder.

Discussion

This study presents the patterns of association between personality traits, childhood trauma, empathy, and PTSD symptoms among women patients seeking treatment for SUD in Turkey. The principal finding was that the women with both SUD and PTSD had higher numbers of suicide attempts, higher substance-use severity, higher frequency and intensity of borderline personality traits, and higher rates of childhood trauma—especially sexual abuse—than did those with SUD alone.

The findings in this study are consistent with previous reports that reported the PTSD rates in a population of patients with SUD. Symptoms of PTSD were seen in 37.9% of the patients in the present study; Ouimette et al⁴ noted that up to 43% of patients had PTSD symptoms, whereas Dore et al² reported that almost 45% of patients screened positive for PTSD symptoms.

The number of attempted suicides was higher in the PTSD+ group in the present study. Similar to our findings, previous studies concluded that PTSD+ patients had had higher rates of self-harm or attempted suicide. Furthermore, women patients had a higher rate of history of attempted suicide than did men.² Moreover, the present study found no significant difference between the PTSD+ and PTSD– patients in the rate of patients who had attempted suicide, even after controlling for BPQ scores. High rates of depressive symptoms and suicidality were reported in previous studies; therefore depressive symptoms may be the underlying cause of this surprising finding.⁴¹

PTSD+ women had more severe SUD symptoms than PTSD– women; this had been shown repeatedly in previous studies.^{7,25} Therefore, in women with SUD–PTSD comorbidity, clinical interventions prioritizing both substance- and trauma-focused psychotherapies might contribute to higher treatment retention.

Another finding in the present study was that the SUD plus PTSD group had significantly higher total BPQ scores than did the SUD-alone (PTSD–) group. Within BPD samples, previous studies showed that 33%–79% of these patients also had PTSD symptoms.⁴² Borderline personality traits were significant and more predominant than psychopathic traits in our PTSD+ group. A prospective study revealed that patients with BPD manifested a 3-fold higher incidence of PTSD *de novo* relative to subjects with other personality disorders (27% vs. 8%).⁴³ Some researchers posit that emotional dysregulation in BPD patients could exaggerate anxious reactions in response to traumatic events.¹² In our study, BPQ scores were associated with substance-use severity independent of the presence of PTSD. These findings strengthen previously reported associations between emotional abuse, BPD, and SUD.⁴⁴ Therefore, it is clinically important to investigate the presence of trauma and PTSD in substance-use women with BPD, as it is in BPD-diagnosed women without substance use.

Our results, in line with previous findings, revealed that female patients with PTSD had higher CTQ scores, especially for sexual abuse. It was reported that female patients more often experienced childhood trauma, especially sexual abuse. Secondary, but not primary, psychopathy was reported to be more tense, more impulsive, and associated with impaired empathic skills. Although impulsivity and impaired empathic skills might overlap in individuals with

borderline personality traits, PTSD, and SUD, these reports relate to our findings, which showed higher secondary psychopathy levels in women with both SUD and PTSD.^{43,44}

There is no consensus in the literature as to whether there is a link between ASPD and PTSD. One study suggested that BPD traits played a significant role in the prediction of PTSD beyond the effects of psychopathy in female prisoners. Therefore, BPD may represent a female-specific expression of antisocial personality.⁴⁵

Our data showed that affective empathy scores were higher in SUD patients with PTSD than in SUD patients without PTSD. Perhaps lower empathy is a risk factor for PTSD; some scholars hypothesized that soldiers with higher levels of empathy experience greater arousal and are more likely to develop symptoms of PTSD after trauma exposure. Consistent with these results is a report that a potential increase in affective empathy was observed among individuals with PTSD. These results were also replicated in studies reporting higher empathic concern in patients with BPD. In the light of strong evidence, we might assume that empathic responding is altered in individuals with PTSD. On the other hand, one could hypothesize that empathy impairment may be related to substance use, but in line with some previous studies, the severity of SUD was independent of sociocognitive deficits.^{16,18}

The findings of the present study have several clinical implications. First, providers offering substance-use treatment to women should screen for PTSD history, because these patients are likely to have higher rates of childhood trauma, especially sexual abuse. Understanding the unique associations between childhood trauma and borderline personality traits and how they interact with substance use could inform treatment planning. Second, it might be important for settings that are focused on patients with BPD to ensure that they have resources available for empathy-focused therapeutic interventions. The present study presents the aforementioned clinical characteristics of women with SUD, in Turkey, for the first time.

Our study has some limitations. First, although the prevalence of female substance users in Turkey (7.2%) was reported to be lower than that of male substance users (92.8%), the sample size of our study may have limited the power of the study.⁴⁶ Furthermore, methodological restrictions prevented the use of random sampling in the study. In the literature, there was a suggestion that the incidence of substance-user women in Turkey might have been underreported due to lack of social support and prejudice from the social environment. Despite the lack of evidence about stigma in women with SUD in Turkey, data from Western countries may not represent the same difficulties as that of people living in non-Western countries, because of the differences in cultural values. Perceptions of family honor and shame have been found to correlate with reduced formal help-seeking decisions and treatment admission for substance use disorders.⁴⁷ Second, given the high rates of depressive symptoms associated with PTSD, we could not examine depressive symptoms as a covariant factor in our results.² Third, retrospective self-report questionnaires were used in our study. Despite being well-validated, future studies with behavioral measures and prospective designs may lead to more accurate outcomes. Fourth, because our sample consisted of women with SUD, the present results cannot be generalized to men with SUD.

Our results suggest, at least in women, that comorbidity of PTSD and SUD resulted in a more complicated presentation, including higher addiction severity, increased rates of childhood trauma, higher rates of borderline personality traits, and disruption of empathy. It seems to be crucial for practitioners to screen for PTSD symptoms in women with severe SUD and complicated clinical presentations. Integrated treatment approaches, such as combining coping skills, fear habituation, and cognitive restructuring, might reduce symptom severity and negative emotionality related to empathy impairments.⁴⁸ Furthermore, childhood traumas, especially sexual abuse, might precede the other clinical variables. Examination of sexual trauma history in women with SUD might be beneficial to providing the most convenient treatment protocol. In the future, especially adolescents, may be at serious risk of trauma and may have their first experience of substance use, thus protective studies regarding early family intervention and longitudinal studies about treatment retention rates are warranted.

Availability of Data and Materials: The datasets generated and/or analyzed during the current study are not publicly available due to ethical concerns but are available from the corresponding author on reasonable request.

Ethics Committee Approval: This study protocol was approved by the Ethics Committee of Antalya Research and Training Hospital, (Approval No: 8/13, Date: September 23, 2021).

Informed Consent: Written informed consent was obtained from the participants who agreed to take part in the study.

Peer-review: Externally peer-reviewed.

Author Contributions: Concept – S.K.; Design – S.K.; Supervision – S.K.; Resources – S.K.; Materials – H.G.; Data Collection and/or Processing – S.K., H.G.; Analysis and/or Interpretation – S.K.; Literature Search – S.K.; Writing – S.K.; Critical Review – S.K., H.G.

Acknowledgements: The authors are grateful to the outpatient clinic staff and patients for their participation and support.

Declaration of Interests: The authors have no conflict of interest to declare.

Funding: The authors declared that this study has received no financial support.

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