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ORIGINAL ARTICLE

Cognitive Emotion Regulation Styles and the Impulsive Behavior of Patients with Substance Use Disorders: A Cross-Sectional Study

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Main Points

- A statistically significant negative correlation was found between Cognitive Emotion Regulation Questionnaire subscales of positive refocusing and refocus on planning, with impulsive behavior total scale scores.
- Difficulties experienced in adaptive cognitive emotion regulation could cause impulsive behaviors.

Abstract

This study aimed to examine the correlation between the cognitive emotion-regulation styles and impulsive behaviors of patients who has substance use disorder. A total of 197 patients who were receiving inpatient treatment after diagnosis of substance use disorders in the Alcohol and Substance Addiction Treatment Center in two hospitals participated in study. Ethical permissions were obtained. For data collection, Introductory Information Form, Cognitive Emotion Regulation Questionnaire, UPPS Impulsive Behavior Scale were used. Descriptive statistics and correlational analysis and multiple regression analyses were performed. The mean age of the patients was 39.35 ± 12.43 years, and 88.3% of them were male. Among them, 38.9% used alcohol, and 51.8% used substances. There is a correlation between the patients' cognitive emotion regulation styles and impulsive behavior styles. The multiple regression analysis showed that the patients' cognitive emotion regulation style explained 20.6% of their impulsive behavior.
Keywords: Addiction, emotion regulation, impulsive behavior, substance use disorder.

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Introduction

Globally, in 2019, 36.3 million people suffered from substance use disorders (SUD). According to the World Health Organization (WHO) and United Nations Office on Drugs and Crime (UNODC), the prevalence of substance use is increasing although it varies by nations (UNODC, 2023; WHO, 2021).

Substance use disorder is a psychiatric disorder characterized by desiring to use substances, compulsive thinking about taking substances, using it despite negative consequences, and losing of functionality (American Psychiatric Association, 2013). Researches are trying to understand the important causes that mediate SUDs; neural molecules, reinforcement, tolerance, withdrawal, stress, and trauma etc (Kalin, 2020).

Although many reasons have been investigated, it is also mentioned that emotions and emotion regulation are related to all addictive behaviors and may take part in the start, continuance, maintaining, and cessation of substance abuse (Estévez et al., 2017; Kober, 2014; Morie & Ridout, 2018). Because emotion regulation is associated with many structures and neurotransmitter systems in the brain, and this is thought to be associated with addictive behaviors. For example, decrease in dopamine levels in the nucleus

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accumbens seems to be affected by many regions such as the ventral tegmental area, ventral striatum etc., which are associated with negative emotions in withdrawal and abstinence (Koob & Volkow, 2016). When many emotions come into question, it is important to determine the effect of these emotions. Individuals can engage in substances not only to avoid or try to regulate negative emotions but also to induce positive emotions (Garland, 2021). For example, Dorison et al. mentioned that specifically sadness could increase addictive behaviors such as craving, drinking frequency (Dorison et al., 2020). Wellman et al. (2020) investigated that adolescent who experiences depressive symptoms and feelings are associated with increased drinking frequency (Wellman et al., 2020). Also, individuals who have difficulty with emotion regulation may therefore have difficulty controlling impulsive behaviors, maintaining target-oriented behaviors, and accessing compatible emotion-regulation strategies (Berking et al., 2011; Fox et al., 2007; Gratz & Roemer, 2004).

In one meta-analysis, Weiss et al. (2022) mentioned that *"emotion regulation and substance use were significantly related"* (Weiss et al., 2022). For instance, Fox et al. (2007) mentioned that individuals who use cocaine had difficulties regulating emotions and controlling impulses, especially in the abstinence phase (Fox et al., 2007). Cognitive emotion-regulation strategies help people cope with stressful situations and emotions (Garnefski & Kraaij, 2007). These regulation strategies also help individuals with SUDs cope with all situations they confront. In addition, impulsive behaviors could be associated with negative emotions and negative emotion regulation strategies (e.g., self-blame, rumination) (Naeim et al., 2021). Especially, for individuals with substance use problems, it is mentioned that impulsive behaviors and emotion regulation strategies were related (Reichl et al., 2022), and this relationship may affect substance use negatively.

Individuals with SUD experience difficulties with emotion regulation in every phase of addiction behavior. In related literature, very few studies examine the correlation between the cognitive emotion-regulation styles and impulsive behaviors of patients who have SUD. (Naeim et al., 2021; Reichl et al., 2022). Therefore, determining the effect of cognitive emotion regulation styles on impulsive behaviors is considered important for the treatment and care of individuals with SUDs.

Hypothesis

Cognitive emotion regulation strategies affect impulsive behavior in individuals with SUDs.

Material and Methods

Aim

The study aims to investigate the effect of cognitive emotion-regulation styles on the impulsive behaviors of patients with SUD.

Design and Setting

This descriptive and cross-sectional study was conducted in the Alcohol and Substance Addiction Treatment Center services of a university hospital and a regional psychiatric hospital between March 2019 and March 2020.

Sample

The sample of research consisted of all patients who were diagnosed with alcohol or SUDs based on Diagnostic and Statistical Manual of Mental Disorders, fifth edition, diagnosis criteria received inpatient treatment, had no physical illness, were over the age of 18, and volunteered to participate. There were no marital status, gender, etc., restrictions. The study population included 207 patients with SUDs who received inpatient treatment. The analyses were done using 197 questionnaires.

Data Collection Process

The inclusion criteria of the study was receiving inpatient treatment in the Alcohol and Substance Addiction Treatment Center. After completing one-week detoxification phase of the treatment, patients were informed about the study. After information, patient's informed consent was taken, and they filled the forms face to face. Patients completed questionnaires based on self-report.

Data Collection Tools

Socio-demographic Information Form

This form included 20 open- and close-ended questions about sociodemographic characteristics of patients with alcohol or substance use history which were developed by the researchers.

Cognitive Emotion Regulation Questionnaire

Cognitive Emotion Regulation Questionnaire developed by Garnefski et al. (2001) included 36 items (Garnefski et al., 2001). It contains nine subscales. Cognitive Emotion Regulation Questionnaire is divided into two sections. The first section consisted of theoretically more adaptive subscales: "refocus on planning, acceptance, positive reappraisal, positive refocusing, putting into perspective." The second section consisted of theoretically less adaptive subscales: "self-blame, rumination, catastrophizing, blaming others" (Garnefski et al., 2001). The Turkish adaptation of the 5-point Likert-type scale was conducted by Onat and Otrar (Onat & Otrar, 2010). Thus, the highest score obtained from a subscale indicates that the strategy determined in that subscale is the most used. In our sample, $\alpha = 0.89$.

UPPS Impulsive Behavior Scale

UPPS developed by Whiteside and Lynam to evaluate impulsive behaviors (Whiteside & Lynam, 2001). The scale contains 45 items and four subscales: "negative urgency, lack of premeditation, lack of perseverance, sensation-seeking." It is a Likert-type scale. The Turkish adaptation was conducted by Yargıç et al. (Yargıç et al., 2011). High scores obtained from the scale indicate a more use of impulsive behaviors. In our sample, $\alpha = 0.85$.

Data Analysis

Data were analyzed by SPSS 25 (IBM SPSS Corp.; Armonk, NY, USA). Descriptive statistics, Pearson correlation analysis, and multiple regression analysis were used. The statistical significance level was $p < .05$ in all analysis.

Ethical Consideration

The ethical committee approval numbered 121 was obtained from the Non-Interventional Ethical Committee of a Izmir Katip Celebi university to conduct the study. Additionally, the verbal and written informed consent of the patients who volunteered to participate in the study was obtained.

Results

Of the patients, 88.3% (n = 174) were male and their mean age was 39 ± 12.43 years; 52.8% (n = 104) were primary school graduates; 53.3% (n = 105) had a job; and 51.8% (n = 102) had an income equal to cover their treatment expenses. Among the patients, 62.9% (n = 124) did not have a relationship-based partnership (single, divorced, or separated,). Of the patients, 73.1% (n = 144) used alcohol, 51.8% (n = 102) used substances (cannabinoid, opioid, cocaine, and multiple substance use), 24.9% (n = 49) used both, and 64% (n = 126) had previously undergone treatment (Table 1).

There is a statistically significant correlation between the patients' cognitive emotion regulation subscales and impulsive behavior subscales. The results showed a significant reverse correlation between rumination (r = −.143, p = .04), positive refocusing (r = −.538, p = .00), refocus on planning (r = −.388, p = .00), positive reappraisal (r = −.385, p = .00), putting into perspective (r = −290, p = .00), catastrophizing (r = −.155, p = .03) variables with UPPS subscales of lack of premeditation (Table 2).

There is a strong significant negative correlation between acceptance (r = −.224, p = .002), positive refocusing (r = −.385, p = .00), refocus on planning (r = −.315, p = .00), positive reappraisal (r = −.341, p = .00), putting into perspective (r = −.353, p = .00) with UPPS subscales of lack of perseverance (Table 2).

A significant negative correlation was found between CERQ subdimensions of positive refocusing (r = −298, p = .00) and refocus on planning (r = −262, p = .00) and the total score of impulsive behavior (Table 2). According to the results of the regression analysis, cognitive emotion regulation strategies (rumination, positive refocusing, refocus on planning, positive reappraisal) explained impulsive behavior by 20.6% (Table 3).

Discussion

Most of the participants in this study were middle-aged men, primary school graduates, worked in a job, and lived in the city. The sociodemographic characteristics of patients with substance use disorder.s are similar in relevant studies (Best et al., 2012; Charney et al., 2010; Savaşan & Çam, 2017; Uğurlu et al., 2012).

It has been known that regulation in emotions improved some brain regions' activity and could help individuals for treatment and care for addiction (Tang et al., 2016). Because some risky and impulsive behaviors (e.g., seeking drugs or alcohol, using multiple drugs) seen in addiction have been associated with emotion regulation (Jakubczyk et al., 2018). In one study, it was mentioned that cognitive emotion regulation strategies and impulsivity are related to addiction tendency. Thus, adaptive emotion regulation strategies such as positive refocusing, positive reappraisal could be a protective factor for patients with SUDs who face difficult and stressful situations (Naeim et al., 2021). In our study, results showed that a significant, strong negative correlation was found between CERQ subscales of positive refocusing, positive reappraisal, refocus on planning, putting into perspective with impulsive behavior subscales of lack of premeditation, and lack of perseverance. In other words, increasing adaptive emotion regulation skills might decrease impulsive behavior in SUDs. This relationship could be informative for research on preventing substance abuse.

This study shows a significant correlation between cognitive-emotional regulation styles and impulsive behavior. Individuals who use positive refocusing and refocus on planning strategies are less likely to behave impulsively. According to the CERQ scale; positive refocusing and refocus on planning seem to be an adaptive cognitive emotion regulation strategies; "refocus on

Table 1.
Distribution of Patients by Sociodemographic Characteristics and Addiction History

Sociodemographic Characteristics	Number	Percent (%)
Age (Mean ± SD)	39 ± 12.43	
Sex		
Female	23	11.7
Male	174	88.3
Educational status		
Literate	9	4.6
Primary school	47	23.9
Secondary school	57	28.9
High school	56	28.4
Academy	14	7.1
University	14	7.1
Marital status		
Single	90	45.7
Married	73	37.1
Divorced	31	15.7
Separated	3	1.5
Income level		
Less income than expense	65	33.0
Income equals expense	102	51.8
More income than expense	30	15.2
Profession		
Civil servant	18	9.1
Seasonal worker	6	3.0
Worker	87	44.2
Retired	30	15.2
Landowner	4	2.0
Student	3	1.5
Unemployed	49	24.9
Alcohol use		
Yes	144	73.1
No	53	26.9
Substance use		
Yes	102	51.8
No	95	48.2
Previous attempt to quit alcohol/ substance abuse		
Those who attempted to quit	152	77.2
Those who did not attempt to quit	45	22.8
Previous application for treatment		
Those with previous treatment attempt	126	64.0
Those without previous treatment attempt	71	36.0
Total	197	100.0

Table 2.
The Relationship Between the Patients' Mean Scores on the Subdimensions of the Cognitive Emotion Regulation Questionnaire and UPPS

CERQ		UPPS				
		Lack of Premeditation	Negative Urgency	Sensation Seeking	Lack of Perseverance	UPPS Total
Self-blame	*r*	.072	−.156*	.141*	−.003	.092
	p	.317	.028	.048	.961	.196
Acceptance	*r*	−.043	−.045	.206**	−.224**	.030
	p	.551	.533	.004	.002	.679
Rumination	*r*	−.143*	.035	.154*	−.074	.040
	p	.045	.629	.031	.298	.577
Positive refocusing	*r*	−.538**	.165*	−.131	−.385**	−.298
	p	.000	.020	.067	.000	.000
Refocus on planning	*r*	−.388**	.100	−.094	−.315**	−.262
	p	.000	.163	.189	.000	.000
Positive reappraisal	*r*	−.385**	.228**	−.007	−.341**	−.137
	p	.000	.001	.926	.000	.055
Putting into perspective	*r*	−.290**	−.063	.146*	−.353**	−.126
	p	.000	.377	.041	.000	.077
Catastrophizing	*r*	−.155*	−.115	.107	−.134	−.053
	p	.030	.108	.135	.061	.457
Blaming others	*r*	.055	−.032	.061	.078	.056
	p	.441	.655	.395	.274	.436

Note: *$p < 0.5$, **$p < 0.01$.

Table 3.
The Regression model to investigate the effect of Cognitive Emotion Regulation Questionnaire variables on the UPPS total scores

Dependent Variable	Independent Variables	β	Standard Error	Beta	t	p	F	p	R2	Durbin Watson
Total scores of UPPS	Constant	97.848	4.716		20.747	.000*	5.397	.000*	0.206	2.130
	Self−blame	0.156	0.357	0.046	0.439	.661				
	Acceptance	0.501	0.366	0.118	1.371	.172				
	Rumination	0.790	0.383	0.235	2.061	.041*				
	Positive refocusing	−1.066	0.312	−0.330	−3.420	.001*				
	Refocus on planning	−1.416	0.339	−0.444	−4.173	.000*				
	Positive reappraisal	0.708	0.357	0.224	1.981	.049*				
	Putting into perspective	0.002	0.346	0.001	0.006	.995				
	Catastrophizing	−0.144	0.319	−0.039	−0.451	.652				
	Blaming others	0.193	0.286	0.050	0.673	.502				

Note: Bold values indicate staistical significance.
*$p < .05$.

planning refers to thinking about a positive meaning to the event in terms of personal growth. Refers to thinking about what steps to take and how to handle the negative event. Positive refocusing refers to thinking about pleasant situations instead of thinking about the actual event" (Garnefski & Kraaij, 2007). In other words, it is important to use strategies such as thinking about joyful and pleasant situations (positive refocusing), thinking about the steps to handle negative events (refocus on planning), or creating a positive meaning about stressful life events (positive reappraisal) for patients with SUDs to help to prevent relapses. Similarly, studies have shown that it is crucial for individuals to consider their next steps when faced with a stressful event, refocus on their plan, and make decisions accordingly during the relapse process (Apaydın Demirci et al., 2020; Jakubczyk et al., 2018; Miller & Racine, 2022). In another study, Beyrami et al. (2021) found that cognitive emotion regulation strategies such

as positive refocusing, and refocus on planning, positive reappraisal, and putting into perspective could prevent substance use behaviors in adolescents (Beyrami et al., 2021). For individuals with substance use, change is a dynamic process and it takes up time. On the other hand, these adaptive strategies could prevent substance use by reducing the individual's behavior about premeditating their actions without thinking and focusing on the consequences.

Components of cognitive emotion regulation skills are important for substance use behavior because it has been known that difficulties with emotion regulation could affect impulsive and risky behaviors such as substance use, etc. (Jakubczyk et al., 2018; Miller & Racine, 2022). In some studies, it was explained that the relationship between emotion regulation and addiction, and the relationship between impulsive behavior and addiction, in detail (Beyrami et al., 2021; Naeim et al., 2021; Weiss et al., 2022). In our study, the regression analysis revealed that the cognitive emotion regulation strategy of refocus on planning and positive refocusing was the strongest predictor of impulsive behavior (20.6%).

A multitude of factors influence impulsive behavior in individuals with alcohol SUDs. Studies have demonstrated that personality traits, automatic negative schemas, and certain sociodemographic characteristics also influence impulsive behavior (Arbal, 2019; Argyriou et al., 2018; Soyaslan & Özcan, 2019). The present study aimed to examine the relationship between cognitive emotion regulation styles and impulsive behavior. The results indicated that this relationship accounted for 20.6% of the variance in impulsive behavior. One of the factors affecting impulsive behavior is cognitive emotion regulation style. In order to gain a fuller understanding of the effect of other factors on impulsive behavior, further investigation is required. In light of the aforementioned considerations, it appears that interventions designed to mitigate impulsive behavior should not be limited to the implementation of cognitive strategies. Instead, a more comprehensive approach that incorporates behavioral and emotional techniques is warranted.

In summary, impulsive behavior can be reduced by focusing on positive events and coping with negative situations by considering the necessary steps to take. When evaluating the findings objectively, it becomes clear that the cognitive emotion regulation styles of individuals with SUD. have an impact on impulsive behavior, which in turn may mediate the relapse of individuals. Thus, these results may be important for providing information about one of the causes of relapses in patients with SUDs. Considering the effects of emotion regulation and impulsive behavior, future investigations are needed.

Limitations and Directions

This study has limitations. There is no control group in the study. The research is a cross-sectional study and limited to the centers where the study was conducted. In total, 197 patients with SUDs participated in the study and most of the participants were male. In this study, cognitive emotion regulation strategies, which are thought to influence impulsive behavior, were examined. Impulsive behavior is multifaceted, so the effect of different variables not examined in the study can be investigated. Thus, future research is needed.

This study has shown that a negative correlation exists between the patients' cognitive emotion-regulation styles and impulsive behavior styles. Difficulties experienced in cognitive emotion regulation could cause impulsive behaviors. For clinical approach, it is important to plan trainings for mental health professionals to increase awareness about cognitive emotional regulations and impulsive behaviors.

Ethics Committee Approval: This study was approved by Ethics Committee of Izmir Katip Celebi University (approval no: 121; date: 21.03.2018).

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

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