

# Investigating the Relationship between Behavioral Activation and Inhibition Systems (BIS/BAS) and Effortful Control (EC) with Clinical Symptoms and Personality Disorders in Patients with Substance Abuse Disorders

Fouzieh. Shabtari<sup>1</sup>, Kobra. HajiAlizadeh<sup>2\*</sup>, Zahra. Hajmohammadi<sup>3</sup>

<sup>1</sup> MA in Clinical Psychology, Department of Psychology, Qeshm Branch, Islamic Azad University, Hormozgan, Iran

<sup>2</sup> Associate Professor of Psychology, Department of Psychology, Bandar Abbas Branch, Islamic Azad University, Bandar Abbas, Iran

<sup>3</sup> MA in Clinical Psychology, Department of Psychology, Bandar Abbas Branch, Islamic Azad University, Bandar Abbas, Iran

\* Corresponding author email address: [ph\\_alizadeh@yahoo.com](mailto:ph_alizadeh@yahoo.com)

## Article Info

### Article type:

Original Research

### How to cite this article:

Shabtari, F., HajiAlizadeh, K., & Hajmohammadi, Z. (2023). Investigating the Relationship between Behavioral Activation and Inhibition Systems (BIS/BAS) and Effortful Control (EC) with Clinical Symptoms and Personality Disorders in Patients with Substance Abuse Disorders. *Journal of Assessment and Research in Applied Counseling*, 5(1), 96-103.

<https://doi.org/10.61838/kman.jarac.5.1.13>



© 2023 the authors. Published by KMAN Publication Inc. (KMANPUB), Ontario, Canada. This is an open access article under the terms of the Creative Commons Attribution-NonCommercial 4.0 International (CC BY-NC 4.0) License.

## ABSTRACT

**Objective:** Substance abuse is considered one of the most important factors that threaten well-being and health, so it is important to identify the factors related to this disorder. This study aimed to investigate the relationship between behavioral activation and inhibition systems (BIS/BAS) and effortful control (EC) or clinical symptoms and personality disorders in patients with substance abuse disorders.

**Method:** The descriptive research method was correlation type. The researched population was all the people suffering from substance abuse in 2022 who had visited Jask City addiction treatment centers in the first half of this year, 112 of them were selected using the cluster random sampling method. The measurement tools include the Drug Abuse Screening Test (DAST-20), Carver and White's BIS/BAS Scale (1994), short form of Adult Temperament Questionnaire (ATQ), Symptom Checklist 90-R (SCL-90-R), and Millon Clinical Multiaxial Inventory – Third Edition (MCMI-III). Finally, the collected data were analyzed using Pearson's correlation test and multiple regression under SPSS-23 software.

**Results:** The research data analysis revealed a significant correlation between clinical symptoms and personality disorders. BIS/BAS and effortful control were predictive variables, and their role in predicting most clinical and personality variables was meaningful.

**Conclusion:** In general, the results of this research showed that there is a relationship BIS/BAS and EC with clinical symptoms and personality disorders in patients with substance abuse disorders.

**Keywords:** Behavioral activation system, Behavioral inhibition system, effortful control, clinical symptoms, personality disorders, substance abuse

## 1. Introduction

Addiction disorder, or *substance abuse*, which has become a social harm in recent years, is a chronic and relapsing disorder with high costs for the individual, family, and society (Pirzadeh & Parsakia, 2023). This disorder is repeated substance use in a way that causes failure in work, school, family roles, or sensitive situations such as driving a car or creates legal problems related to substance use (Sepehri & Kiani, 2020). The issue of drug abuse is a global problem affecting different societies worldwide. Unfortunately, few countries are immune to this harm. This disorder is one of the world's four major crises, with an annual financial turnover exceeding 1600 billion dollars, and it impacts at least 200 million people worldwide (Nath et al., 2022). The prevalence of *addiction* in Iran is a major concern, particularly among young people in developing countries, and is associated with significant social and economic consequences (Pirzadeh & Parsakia, 2023).

People at high risk of substance use disorders show less stable and emotionally regulated behavior than those at low risk of addiction (Sepehri & Kiani, 2020). Vulnerability to inhibition or lack of self-regulation is a major risk factor for substance use disorders (Ghadampour et al., 2019). Self-regulation involves regulating behaviors, emotions, and cognitions (Khodadadian, Karami, & Yazdanbakhsh, 2020). Maladaptive emotion regulation strategies are linked to the development and persistence of traumatic states during emotional disturbance (Robson, Allen, & Howard, 2020). *Effortful control* (EC) is a regulatory dimension of mood that includes attentional control, inhibitory control, and activational control, and it reflects self-regulatory abilities that develop in the later stages of life and refer to top-down control (Santens et al., 2020).

According to the dual pathways model, psychopathology results from an imbalance between two complementary neurobiological systems: the impulsive system, which consists of the *behavioral activation system* (BAS) and the *behavioral inhibition system* (BIS), and the reflexive system, which involves top-down self-regulation (Ganesh et al., 2018). According to the dual pathways model, psychopathology results from an imbalance between two complementary neurobiological systems: The first is the impulsive system or bottom-up reaction in terms of the BAS and the BIS, and the second is the reflexive system or top-down regulation in terms of self-regulation (Ganesh et al., 2018). Vulnerability theories of psychopathology emphasize the role of self-regulation or strict control, which may

moderate the association between temperamental reactivity (BIS/BAS) and psychopathology (Degenhardt et al., 2018). The reactive dimensions of mood are explained in the *Reinforcement Sensitivity Theory* (RST); according to this theory, the BAS or tendency motivational system includes those areas of the brain that affect the individual's sensitivity to reward. This system's high activity and sensitivity cause positive emotions and avoidance behavior to be activated, and the BIS is the stopping motivation system. This system includes those areas of the brain that affect a person's sensitivity to punishment. The different sensitivity to reward and punishment signs in different people suggests that people with drug addiction have a weak BIS, or the functioning of the BAS in them is in a way that disrupts the sensitivity of the inhibitory system (Gray, 1982). BIS or BAS reactivity overactivation can be related to various forms of psychopathology because individuals with high BAS activation tend to be more impulsive and extroverted. Conversely, greater BIS leads to greater susceptibility to anxiety and is associated with neuroticism (Santens et al., 2020). Additionally, internalizing problems (such as anxiety and mood disorders) are more likely to be related to an overactive BIS. Previously, externalizing problems (such as substance abuse) were associated with an overactive BAS and an underactive BIS that could not inhibit inappropriate behavior initiated by the BAS (McDonald, 2022). However, regarding reactive and regulatory temperament, EC often moderates the relationship between BIS/BAS reactivity and psychopathology, and internalizing disorders (such as anxiety and mood disorders) are often characterized by high levels of BIS and low levels of EC. In contrast, externalizing disorders (eg, substance abuse and hyperactivity) are characterized by high levels of BAS and low levels of EC. Several studies investigated the role of EC in substance abuse disorders, where low EC was associated with substance abuse at all stages of addiction (Santens et al., 2020).

Also, research has shown that *PD* (PD) are related to substance abuse (Albein-Urios et al., 2019; Trull et al., 2018). Personality is a general term to refer to how people deal with, adapt to, and react to life events (Chanen et al., 2020). According to DSM-5, PD are beyond the normality of normal personality traits in a way that disrupts the two dimensions of self-identity and personal communication. In this version, PD and other mental and medical disorders are placed on axis one and presented as psychiatric and medical disorders. This edition divides PD into three clusters based on their descriptive similarities. People with cluster A

disorders (paranoid, schizoid, and schizotypal PD) often seem strange. People with cluster B disorders (antisocial, borderline, dramatizing, and narcissistic PD) usually seem dramatic, emotional, or unpredictable. Cluster C (avoidant, dependent, and obsessive-compulsive PD) is characterized by fear and anxiety (Reed, 2018). Many patients with substance abuse disorders have co-morbid psychopathologies such as mood and anxiety disorders and PD (especially antisocial and borderline) (Trull et al., 2018).

In addition, psychotic disorders and schizophrenia are also strongly associated with substance abuse disorders (Köck & Walter, 2018). Mood and anxiety disorders are the most common clinical disorders in the general population. Research has shown that anxiety disorders are also commonly seen in connection with substance abuse disorders, the prevalence of which reaches 35%; however, the cause-and-effect relationships between anxiety disorders and substance abuse disorders have not been clearly defined. It also depends on the specific combination of drugs (e.g., cocaine, cannabis) and anxiety disorders (e.g., PTSD, panic disorder) (Hellberg, Russell, & Robinson, 2019). Research on PD shows that cluster B PD are characterized by high BAS, cluster C PD are characterized by high BIS, and cluster A PD are characterized by a combined BIS/BAS pattern (Subramanian, Sękowski, & Żemojtel-Piotrowska, 2020). In addition, research has described impaired self-regulatory capacities (low EC) in PD (Santens et al., 2020). Considering the high coexistence between substance abuse disorders and borderline and antisocial PD, emotion regulation disorders and impulsivity play an important role in both disorders (Trull et al., 2018). Therefore, investigating the effect of BIS/BAS and EC and their interaction in a large sample of substance abuse patients concerning *clinical symptoms* and *PD* provides new insight into the understanding of the role of mood factors in the development of psychological problems associated with abuse. Therefore, according to the materials raised in the present study, the question is whether the BIS/BAS and EC are related to clinical symptoms and PD in patients with substance abuse disorders.

## 2. Methods

### 2.1. Study design and Participant

The research method was descriptive and correlational; In this regard, the researcher did not intend to manipulate the variables. Also, this research was predictive (multiple regression) regarding data analysis. The research's statistical population was all those suffering from drug abuse in 2022

who had been referred to Jask drug addiction treatment centers in the first half of this year. The random cluster sampling method selected samples from the target statistical population. At first, a list of addiction treatment centers in Jask City was prepared, and then two centers were randomly selected from among the addiction treatment centers. Then the number of samples was selected from each center. A substance use screening questionnaire was used to select the sample. The sample size was determined to be 123 individuals based on the total statistical population and according to the table proposed by Krejcie and Morgan (1970) (Krejcie & Morgan, 1970). Due to the lack of complete and correct responses from the patients undergoing addiction treatment, 11 questionnaires were removed from the analysis of the results, and finally, 112 questionnaires were analyzed. The criteria for entering the research included a declaration of willingness to participate, not suffering from acute physical and psychological diseases, and having reading and writing literacy, which was collected from the sample as a self-report. The criteria for exiting the research were mood or PD that the researcher found to disrupt the work process of the test group and to conduct the research and unwillingness to continue the research on the participant's part. After choosing the subject and explaining the research objectives, the confidentiality of the study, how to respond to the research tools, and obtaining informed consent and commitment to respond completely, the questionnaires were randomly distributed to the research samples. Finally, the collected data were analyzed using Pearson's correlation test and simultaneous multiple regression under SPSS-23 software.

### 2.2. Measurements

Drug Abuse Screening Test (DAST-20), Carver and White's BIS/BAS Scale (1994), short form of Adult Temperament Questionnaire (ATQ), Symptom Checklist 90-R (SCL-90-R), and Millon Clinical Multiaxial Inventory – Third Edition (MCMI-III).

#### 2.2.1. Drug Abuse Disorder

DAST-20 by Skinner in 1982. The original version of the test, which was made after the widespread use of the Michigan Alcohol Consumption Screening Questionnaire, had 28 statements. Still, after a while, 20 and 10-year versions of the test were prepared, which are currently used more than these versions. It should be noted that this questionnaire has two separate forms for adults and

teenagers. This test can be used for community screening to find clinical cases and research related to treatment evaluation. This questionnaire has 20 statements that the subject must specify by choosing a yes or no answer. In the substance use screening questionnaire, yes answers are given 1 point, and no answers are given 0 points. In terms 4 and 5, the scoring is done in reverse; 0 points are given to the yes answer, and 1 point is given to the no answer. The highest score, 20, indicates basic problems. To investigate the psychometric properties of the substance abuse screening questionnaire, this test was performed by Skinner (1982) on a sample of 256 clients suffering from alcohol abuse. Cronbach's alpha coefficient of this questionnaire has been reported as 0.92, which indicates the excellent reliability of this test (Skinner, 1982).

### 2.2.2. *BIS/BAS*

Carver and White's BIS/BAS Scale (1994) is a 24-item self-report questionnaire. The BIS subscale in this questionnaire includes seven items that measure the sensitivity of the BIS in response to threats. On the other hand, the BAS subscale also includes 13 items that evaluate the sensitivity of the BAS. BAS in this questionnaire includes three subscales: drive (4 questions), response to reward (5 questions) and entertainment seeking (4 questions). Four additional items in the scale are included as cover items that do not play a role in the BAS/BIS assessment. Items are rated on a four-point scale by the subject. Carver and White reported the internal consistency of the BIS subscale as 0.74 and the internal consistency of the BAS as 0.71 (Carver & White, 1994).

### 2.2.3. *Effortful Control*

Short form of ATQ by Rothbrat, Ahadi and Evans (2000) and consists of 77 items, which include 4 dimensions of intelligent control, negative affect, extroversion/joyfulness, and sensitivity orientation after the intelligent control of this questionnaire used in this research. It includes three subscales: attention control (5 questions), inhibition control (7 questions), and activity control (7 questions). All the questions of this questionnaire are graded on a 7-point Likert scale from (1 completely false to 7 completely true). The factors of this questionnaire are highly correlated with the scales of the big five personality factors. It is also found that the measures that measure the reaction time significantly correlate with the factor of intelligent control. Cronbach's alpha coefficients of the subscales of this test have been

reported in the range of 0.75 to 0.81 (Rothbart, Ahadi, & Evans, 2000).

### 2.2.4. *Clinical symptoms*

SCL-90-R was used as a screening tool to measure clinical symptoms in this research. This tool consists of 9 dimensions and 90 items. The nine dimensions are anxiety, aggression, depression, sensitivity in mutual relationships, physical complaints, obsessive-compulsive, morbid fear, psychosis, and paranoia. The scoring of this questionnaire consists of 90 questions including five grades (none, a little, to some extent, a lot, very much) where none gets a score of 0 and very much gets a score of 4 (Derogatis & Savitz, 1999). In addition to the above nine dimensions, three general criteria are also included in this questionnaire, including The morbid symptoms (GSI), discomfort quotient (PSDI), and the sum of morbid symptoms (PST), and the scoring and interpretation of the questionnaire are based on three indicators. A cut-off point of 2.5 is used to determine the prevalence of psychological symptoms in each dimension, and an average score of 2.5 and above in each dimension is considered a pathological condition. In GSI, the cut-off point is 1.3. The same cut-off point has been used in most of the research conducted in Iran. Many studies confirm the good reliability and validity of this questionnaire (Sepehri & Kiani, 2020).

### 2.2.5. *Personality disorders*

The MCMI-III was evaluated and revised in 1994. This questionnaire has 175 statements about personality and behavior that the clients answer as "true" or "false" according to whether it applies to them. The subject's reading ability should be at least at the eighth-grade level. This questionnaire has 28 scales, and out of these 28 scales, four scales (Z, Y, X, and V indices that measure validity, disclosure, desirability, and self-deprecation, respectively) are dedicated to its validity and reliability. 11 scales measure clinical personality patterns (including schizoid, avoidant, depressive, dependent, dramatic, narcissistic, antisocial, abusive, obsessive, negative, and self-injurious). Three scales indicate severe personality patterns (including schizotypal, borderline, and paranoid). Seven scale measures clinical symptoms (including anxiety, somatic disorder, bipolar, depression, alcohol dependence, drug dependence, and post-traumatic stress disorder). Three other scales measure serious clinical symptoms (thought disorder, major

depression, and delusional disorder) (Millon & Davis, 2013).

### 2.3. Data Analysis

The collected data were analyzed using Pearson's correlation test and multiple regression under SPSS-23 software.

### 3. Findings and Results

In the present study, the mean and standard deviation of the age of the research samples was 40.54±10.49 and for the history of addiction was 11.32±7.69. 62 people (55.4%) were under-diploma, 32 people (28.6%) had a diploma, 6 people (5.4%) had an associate degree, 11 people (9.8%) had a bachelor's degree, and 1 person (0.9%) had a master's degree. In terms of marital status, 12 people (10.7 percent) were single, and 100 people (89.3 percent) were married.

**Table 1**

#### Descriptive findings

Variable	Comp.	Mean	SD	Skewness	Kurtosis	
BIS/BAS	Activation	30.32	5.54	0.167	0.177	
	Inhibition	6.83	3.53	0.187	-0.723	
CS	Somatization	8.48	6.10	0.830	0.527	
	OCD	10.40	5.48	0.643	0/059-	
	Interpersonal sensitivity	8.56	5.16	0.802	0.286	
	Depression	9.92	7.76	1.024	0.828	
	Anxiety	6.55	5.30	1.163	1.181	
	Hostility	5.80	4.26	1.011	0.914	
	Phobic anxiety	3.16	3.36	1.291	1.223	
	Paranoid ideation	6.49	3.44	0.255	-0.396	
	Psychoticism	5.40	5.45	1.132	0.387	
	PD	Schizoid	6.66	5.01	-0.284	-0.727
		Avoidant	5.53	3.06	0.045	-0.820
		Depressive	5.41	3.50	0.398	-0.829
		Dependent	6.10	2.84	0.449	0.036
		Histrionic	10.15	2.52	-0.147	-0.673
Narcissistic		10.26	2.23	-0.180	0.025-	
Antisocial		7.93	3.45	-0.251	-0.826	
Passive-aggressive		8.30	3.89	0.062	-0.252	
Obsessive-compulsive		10.50	2.25	0.043	0.332	
Masochist		6.91	3.67	0.098	-0.825	
EC	Sadistic	5.08	3.24	0.413	-0.590	
	Borderline	5.08	3.16	0.207	-0.877	
	Paranoid	6.07	3.14	0/033	0/807	
	Schizotypal	4.08	3.27	0.772	0.176	
		75.84	14.48	-0/279	-0.279	

Table 1 shows the mean and standard deviation of BIS/BAS, clinical symptoms, PD, and EC. Also, the skewness and kurtosis values showed that the data have a normal distribution.

**Table 2**

#### The results Pearson correlations

Var.	Comp.	BAS	BIS	EC	
CS	Somatization	0.104	0.626**	0.534**	
	OCD	0.076	0.679**	0.530**	
	Interpersonal sensitivity	0.115	0.581**	0.472**	
	Depression	0.007-	0.527**	0.496**	
	Anxiety	0.084	0.565**	0.566**	
	Hostility	0.200*	0.509**	0.473**	
	Phobic anxiety	-0.066	0.460**	0.438**	
	PD	Paranoid ideation	0.027	0.533**	0.274**
		Schizoid	0.112	0.358**	0.376**
		Avoidant	-0.005	0.481**	0.412**
Depressive		-0.035	0.382**	0.437**	
Dependent		-0.147	0.437**	0.443**	
Histrionic		0.114	0.390**	0.367**	
Narcissistic		-0.012	-0.360**	-0.265**	
Antisocial		-0.210*	0.319**	0.194*	
Passive-aggressive		-0.012	0.413**	0.478**	
Obsessive-compulsive		-0.080	0.495**	0.521**	
Schizoid		-0.013	-0.272**	-0.247**	
Masochist		-0.030	0.472**	0.464**	
Sadistic		-0.060	0.352**	0.454**	
Borderline		0.082	0.452**	0.433**	
Paranoid	-0.241*	0.397**	0.321**		
Schizotypal	-0.057	0.369**	0.377**		

\*P < 0.05; \*\*P < 0.01

According to Table 2, there is a positive and significant correlation between clinical symptoms and predictor variables of BIS and EC. Still, there is only a correlation between BAS and clinical symptoms of aggression, and there is no significant correlation with other symptoms. Also, there is a significant correlation between PD with predictor variables of BIS and EC. Still, there is a negative and significant correlation between BAS and narcissistic and paranoid personality disorder and no significant correlation with other PD.

To use multiple linear regression to analyze the results, four assumptions were checked. These presuppositions, which included the location of the research variables at the distance/relative level, the normality of the dependent variable, the independence of the error values, and the non-collinearity of the independent variables, were confirmed.

**Table 3**

*Results of regression model*

Var.	Comp.	R2	Sig.	BAS	Sig.	BIS	Sig.	EC	Sig.
CS	Somatization	0.482	0.001	0/105	0.132	0.484	0.001	0.314	0.001
	OCD	0.529	0.001	0/078	0.238	0.553	0.001	0.279	0.001
	Interpersonal sensitivity	0.405	0.001	0/116	0.120	0.463	0.001	0.262	0.002
	Depression	0.361	0.001	-0/006	0.938	0.381	0.001	0.323	0.001
	Anxiety	0.446	0.001	0/085	0.240	0.389	0.001	0.389	0.001
	Hostility	0.373	0.001	0/200	0.010	0.372	0.001	0.303	0.001
	Phobic anxiety	0.282	0.001	-0/065	0.426	0.328	0.001	0.290	0.001
	Paranoid ideation	0.286	0.001	0/030	0.715	0.514	0.001	0.041	0.656
PD	Psychoticism	0.186	0.001	0/001	0.995	0.237	0.017	0.268	0.007
	Schizoid	0.278	0.001	-0/004	0.962	0.370	0.001	0.244	0.009
	Avoidant	0.235	0.001	-0/036	0.673	0.231	0.016	0.332	0.001
	Depressive	0.288	0.001	-0/146	0.074	0.296	0.002	0.309	0.001
	Dependent	0.211	0.001	-0/114	0.187	0.281	0.004	0.240	0.014
	Histrionic	0.143	0.001	-0/013	0.881	0.302	0.003	-0.128	0.204
	Narcissistic	0.150	0.001	-0/212	0.019	-0.293	0.004	-0.060	0.564
	Antisocial	0.277	0.001	-0/012	0.882	0.246	0.008	0.366	0.001
	Passive-aggressive	0.362	0.001	-0/080	0.301	0.325	0.001	0.373	0.001
	Obsessive-compulsive	0.093	0.014	0/013	0.884	0/201	0.053	-0.155	0.134
	Schizoid	0.303	0.001	-0/034	0.669	0.329	0.001	0.315	0.001
	Masochist	0.236	0.001	-0/060	0.474	0.183	0.055	0.371	0.001
	Sadistic	0.276	0.001	-0/081	0.323	0.321	0.001	0.288	0.002
	Borderline	0.240	0.001	-0/240	0.005	0.314	0.001	0.180	0.058
	Paranoid	0.195	0.001	-0/057	0.510	0.249	0.012	0.265	0.007

According to the results of the [Table 3](#), behavioral activation and inhibition variables along with EC have been entered into the equation, which is significant according to the significance level of the F test of the prediction model. Also, the standardized coefficients of predictor variables show that in most variables the role of behavioral inhibition and EC is significant, but not significant for behavioral activation. Also, behavioral activation and inhibition variables along with EC have been entered into the equation, which is significant according to the significance level of the F test of the prediction model. Also, the standardized coefficients of predictor variables show that in most variables the role of behavioral inhibition and EC is significant, but not significant for behavioral activation.

#### 4. Discussion and Conclusion

This research aimed to investigate the relationship BIS/BAS and EC with clinical symptoms and PD in patients with substance abuse disorders. The results of the research data analysis showed a positive and significant correlation between the clinical symptoms and PD with the predictive variables of behavioral inhibition and EC, and the role of behavioral inhibition and EC is significant in predicting most of the clinical and personality variables. These findings are

in line with much research done in this field ([Köck & Walter, 2018](#); [Reed, 2018](#); [Santens et al., 2020](#); [Subramanian, Sękowski, & Żemojtel-Piotrowska, 2020](#); [Trull et al., 2018](#)). It can be said that since EC refers to the ability to regulate behavior, emotions, and cognition, it can be considered a factor for adaptive and adverse outcomes in people ([Trull et al., 2018](#)). Based on the current theoretical view, the interaction between some reactive mood characteristics (BIS/BAS) and self-regulatory capacities (EC) may increase or decrease the risk of psychopathology. This conflict may be due to not paying attention to a long-term goal of self-regulation, limiting attention to the current emotional turmoil, and finally achieving quick satisfaction, such as smoking or acting impulsively to escape from this state ([Santens et al., 2020](#)). People at high risk of substance abuse show more unregulated and unstable emotional behaviors than people at low risk of addiction, and based on this, poor emotional regulation is a strong predictor for substance abuse ([Ghadampour et al., 2019](#)). Furthermore, internalizing problems (e.g., anxiety and mood disorders) are more likely to be related to an overactive BIS. In contrast, externalizing problems (such as SUDs) are associated with an overactive BAS and an underactive BIS that fails to inhibit BAS-initiated maladaptive behavior ([Degenhart et al., 2018](#)). In

terms of reactive and regulatory temperament, EC often moderates the relationship between BIS/BAS reactivity and psychopathology. It is, therefore, natural that high levels of BIS and low levels of EC often characterize internalizing disorders (such as anxiety and mood disorders). Likewise, externalizing disorders (e.g., mood and anxiety disorders) are characterized by high BAS and low EC levels (Santens et al., 2020). In other words, BIS and BAS may predispose people to a certain type of stress response. People with higher BIS are likelier to react negatively to stress and evaluate stressors as threatening. These individuals actively avoid stressor and experience negative emotions. At the same time, those with higher BAS are more likely to react positively to stress, manage stressful events, and return more quickly to calm relaxation. Individuals higher in BAS are likely to be proactive in their response to stress and are more likely to be reward-oriented. This often leads to an approach response (Gray, 1982; Reed, 2018), and thus, the results regarding the association of BIS with clinical symptoms and PD can be explained. In other words, the experience of avoiding stress and feeling threatened by the source of stress prepares the conditions for psychological injuries. Also, considering that EC often moderates the relationship between BIS/BAS reactivity and psychopathology, different levels of EC can also be effective in the occurrence of injuries and PD (Santens et al., 2020).

## 5. Limitations

The present study had some limitations, such as the fact that the sample was limited to one city, and caution should be exercised in generalizing the findings to the entire Iranian

society. In addition, this research was conducted cross-sectionally and did not allow causal inference, so it is suggested that in future research, sampling from different societies of Iran should be done, and longitudinal designs should be used to investigate the causal relationships between variables. Also, the limitation of the measurement tools and the related biases can be one of the limitations of this research.

## 6. Suggestions and Applications

In general, this research showed a relationship between BAS/BIS and EC with clinical symptoms and PD in patients with substance abuse disorders. These results are important because substance abuse disorder in developing countries like Iran has adverse social and economic consequences. In this way, the results of this research can be used at the macro and policy levels.

## Acknowledgments

The cooperation of all participants in the research is thanked and appreciated.

## Declaration of Interest

The authors of this article declared no conflict of interest.

## Ethics principles

In this research, ethical standards including obtaining informed consent, ensuring privacy and confidentiality were observed.

## References

- Albein-Urios, N., Martinez-Gonzalez, J. M., Lozano-Rojas, O., & Verdejo-Garcia, A. (2019). Dysfunctional Personality Beliefs Linked to Emotion Recognition Deficits in Individuals With Cocaine Addiction and Personality Disorders [Brief Research Report]. *Frontiers in Psychiatry*, 10. <https://doi.org/10.3389/fpsy.2019.00431>
- Carver, C. S., & White, T. L. (1994). Behavioral inhibition, behavioral activation, and affective responses to impending reward and punishment: the BIS/BAS scales. *Journal of personality and social psychology*, 67(2), 319. <https://doi.org/10.1037/0022-3514.67.2.319>
- Chanen, A. M., Nicol, K., Betts, J. K., & Thompson, K. N. (2020). Diagnosis and Treatment of Borderline Personality Disorder in Young People. *Current psychiatry reports*, 22(5), 25. <https://doi.org/10.1007/s11920-020-01144-5>
- Degenhardt, L., Charlson, F., Ferrari, A., Santomauro, D., Erskine, H., Mantilla-Herrera, A., Whiteford, H., Leung, J., Naghavi, M., & Griswold, M. (2018). The global burden of disease attributable to alcohol and drug use in 195 countries and territories, 1990–2016: a systematic analysis for the Global Burden of Disease Study 2016. *The Lancet Psychiatry*, 5(12), 987-1012. [https://doi.org/10.1016/S2215-0366\(18\)30337-7](https://doi.org/10.1016/S2215-0366(18)30337-7)
- Derogatis, L. R., & Spitzer, R. L. (1982). The SCL-90-R, Brief Symptom Inventory, and Matching Clinical Rating Scales. <https://psycnet.apa.org/record/1999-02767-022>

- Ganesh, S., Kandasamy, A., Sahayaraj, U. S., & Benegal, V. (2018). Behavioral activation and behavioral inhibition sensitivities in patients with substance use disorders: A study from India. *Indian Journal of Psychiatry*, 60(3), 346. [https://doi.org/psychiatry.IndianJPsychiatry\\_323\\_18](https://doi.org/psychiatry.IndianJPsychiatry_323_18)
- Ghadampour, E., Mahdiani, z., Padervand, h., Amraei, b., & Sore, H. (2019). The predict addiction to cyberspace and tendency to high-risk behaviors based on emotional self-regulation in high school male students in Tehran. *Educational Psychology*, 15(53), 93-108. <https://doi.org/10.22054/jep.2020.35879.2406>
- Gray, J. A. (1982). *The neuropsychology of anxiety: An enquiry into the functions of the septo-hippocampal system*. Clarendon Press/Oxford University Press. <https://psycnet.apa.org/record/1992-98224-000>
- Hellberg, S. N., Russell, T. I., & Robinson, M. J. F. (2019). Cued for risk: Evidence for an incentive sensitization framework to explain the interplay between stress and anxiety, substance abuse, and reward uncertainty in disordered gambling behavior. *Cognitive, Affective, & Behavioral Neuroscience*, 19(3), 737-758. <https://doi.org/10.3758/s13415-018-00662-3>
- Khodadadian, M. R., Karami, J., & Yazdanbakhsh, K. (2020). prediction of addiction potential based on intentional self regulation and positive youth development in high school students in Kermanshah city [Research]. *Research on Addiction*, 13(54), 109-125. <http://etiadpajohi.ir/article-1-1986-en.html>
- Köck, P., & Walter, M. (2018). Personality disorder and substance use disorder – An update. *Mental Health & Prevention*, 12, 82-89. <https://doi.org/10.1016/j.mhp.2018.10.003>
- Krejcie, R. V., & Morgan, D. W. (1970). Determining sample size for research activities. *Educational and psychological measurement*, 30(3), 607-610. <https://doi.org/10.1177/001316447003000308>
- McDonald, L. (2022). Developing a Systematic Training Programme in Women’s Mental Health. *European Psychiatry*, 65(Suppl 1), S51. <https://doi.org/10.1192/j.eurpsy.2022.171>
- Millon, T., & Davis, R. D. (2013). The MCMI–III: Present and future directions. In *Emerging Issues and Methods in Personality Assessment* (pp. 69-85). Routledge. <https://www.taylorfrancis.com/chapters/edit/10.4324/9780203774618-6/mcmi%E2%80%93iii-present-future-directions-theodore-millon-roger-davis>
- Nath, A., Choudhari, S. G., Dakhode, S. U., Rannaware, A., Gaidhane, A. M., Dakhode, S., & Gaidhane, A. (2022). Substance abuse amongst adolescents: an issue of public health significance. *Cureus*, 14(11). <https://doi.org/10.7759/cureus.31193>
- Pirzadeh, S., & Parsakia, K. (2023). A Comparative Study of Family Structure (Cohesion and Flexibility) and Functioning in People with and without Drug Abuse. *International Journal of Body, Mind & Culture*, 10(1), 82-89. <https://doi.org/10.22122/ijbmc.v10i1.278>
- Reed, G. M. (2018). Progress in developing a classification of personality disorders for ICD-11. *World Psychiatry*, 17(2), 227. <https://doi.org/10.1002/wps.20533>
- Robson, D. A., Allen, M. S., & Howard, S. J. (2020). Self-regulation in childhood as a predictor of future outcomes: A meta-analytic review. *Psychological bulletin*, 146(4), 324. <https://doi.org/10.1037/bul0000227>
- Rothbart, M. K., Ahadi, S. A., & Evans, D. E. (2000). Temperament and personality: origins and outcomes. *Journal of personality and social psychology*, 78(1), 122. <https://doi.org/10.1037//0022-3514.78.1.122>
- Santens, E., Claes, L., Dierckx, E., & Dom, G. (2020). Effortful control—A transdiagnostic dimension underlying internalizing and externalizing psychopathology. *Neuropsychobiology*, 79(4-5), 255-269. <https://doi.org/10.1159/000506134>
- Sepehri, M., & Kiani, Q. (2020). The Relationship between Cognitive Emotion Regulation and Addiction Tendency: The Mediating Roles of Social and Emotional Loneliness and Early Maladaptive Schemas [Research]. *Research on Addiction*, 14(56), 313-338. <https://doi.org/10.29252/etiadpajohi.14.56.313>
- Skinner, H. A. (1982). The drug abuse screening test. *Addictive behaviors*, 7(4), 363-371. [https://doi.org/10.1016/0306-4603\(82\)90005-3](https://doi.org/10.1016/0306-4603(82)90005-3)
- Subramanian, Ł., Sękowski, M., & Żemojtel-Piotrowska, M. (2020). Behavioral inhibition system (bis), behavioral activation system (bas), and grandiose facets of narcissism. *Current Psychology*, 1-7. <https://doi.org/10.1007/s12144-020-00927-6>
- Trull, T. J., Freeman, L. K., Vebares, T. J., Choate, A. M., Helle, A. C., & Wycoff, A. M. (2018). Borderline personality disorder and substance use disorders: an updated review. *Borderline personality disorder and emotion dysregulation*, 5(1), 1-12. <https://doi.org/10.1186/s40479-018-0093-9>