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Examining Factors Influencing Length of Stay for Inpatients at Alcohol and Substance Addiction Treatment Center

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Abstract

Objective: The aim of this study is to determine the impact of impulsivity, treatment motivation, anxiety, and cognitive distortions on the duration of inpatient treatment for substance use.

Methods: The sample for the study consisted of 200 volunteer patients receiving inpatient treatment at the Alcohol and Substance Addiction Treatment Center. Participants underwent a general psychopathological evaluation using the Structured Clinical Interview for DSM-5 (SCID-5) administered by the clinician. All participants were given the Case Report Form prepared by the clinician along with the Barratt Impulsivity Scale-11 Short Form (BIS), Automatic Thoughts Scale (ATS), State and Trait Anxiety Inventory (STAI-I, STAI-II) and Treatment Motivation Questionnaire (TMQ).

Results: A significant distinction was noted in discharge statuses when comparing scores on the Barratt Impulsiveness Scale and nonplaning impulsiveness subscale, and the State and Trait Anxiety Inventory and Automatic Thoughts Scale. Those who were discharged with remission had notably lower scores compared to those who left voluntarily or were discharged due to rule violation ($p< 0.001$). Negative significant correlations were found between length of stay and Barratt Impulsiveness Scale and its subscales [BIS-T ($p<0.001$), BIS-NI ($p<0.001$), BD-MI ($p=0.002$), BD-AI ($p<0.001$)], State-Trait Anxiety Inventory ($p<0.001$), and Automatic Thoughts Scale ($p<0.001$) scores. Positive significant correlations were observed between duration of substance use and Barratt Impulsiveness Scale and its subscales [BIS-T ($p<0.001$), BIS-NI ($p<0.001$), BD-MI ($p=0.003$), BD-AI ($p=0.021$)], State-Trait Anxiety Inventory ($p<0.001$), and Automatic Thoughts Scale ($p=0.035$) scores.

Conclusion: This study demonstrates a relationship between the length of time spent in inpatient treatment, discharge outcomes, and certain substance use behaviors, impulsivity, automatic thoughts, and anxiety in substance abuse patients.

Keyword: Anxiety, Automatic Thought, Impulsivity, Motivation, Substance

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INTRODUCTION

Among the most common psychiatric disorders, alcohol and substance use disorder is a major contributor to disability in society and is a significant public health concern (1). The United Nations World Drug Report released in 2023 revealed that substance use has risen by 23% over the past decade, and it is projected that one in every 17 individuals between the ages of 15 and 64 use substances in 2021 (2).

While outpatient treatment is commonly utilized for substance addiction, those with low treatment compliance and a high risk of relapse are typically recommended for inpatient treatment. The implementation of inpatient treatment targets the intricate treatment demands of patients. Despite efforts, a recurring difficulty is that a substantial portion of patients are unable to complete the intended inpatient program as planned (3). Factors leading to the discontinuation of treatment or release of inpatient substance addiction patients can vary based on the individual, illness, treatment facility, and personnel. In addition to the patient's age, gender, education level, expectations for treatment, and comorbidities, disease-related factors like multiple substance use, type of substance, and the intensity of withdrawal symptoms and cravings must also be taken into account. Apart from the treatment facility's physical setup and features, the training and professional mindset of the treatment staff can also play a role in treatment discontinuation.

One of the patient-related factors is impulsivity characteristics. Impulsivity can be defined as the act of responding rapidly and without planning to an internal or external stimulus, with little regard for the potential positive or negative effects on oneself or others (4,5). Substance use affects the activity of the prefrontal cortex, which is responsible for impulse control. These circumstances may provoke patients to exhibit behaviors such as carelessness, impatience, seeking excitement, and taking risks that are deemed too excessive or unsuitable for the setting, often resulting in undesirable outcomes (6). Conversely, research has shown that individuals with high impulsivity are at a higher risk for substance use and relapse (7,8). Impulsivity, which is the core symptom of some psychiatric diseases, is discussed in a three-dimensional structure. Motor impulsivity defines acting without thinking, attention-related impulsivity describes the lack of focus or inability to concentrate, and inability to plan impulsivity describes the lack of prediction or foresight about the future (23).

Treatment motivation plays a significant role in the initiation and continuation of treatment for substance use disorders (9). In order for an addicted person to recover, they must be willing to give up the source of their pleasure and endure the challenges of ongoing treatment. For this reason, the treatment's effectiveness is greatly influenced by a person's determination and eagerness to continue with the treatment process (10). The research indicates that a lack of readiness for change and low motivation for treatment are strong predictors of relapse (11,12). The continuity of patients' treatment is negatively impacted by this situation, which could result in them discontinuing the treatment process (13).

Automatic thoughts are cognitions specific to the environment and situation that take place in the mind flow and mostly accompany moments of emotional distress. These thoughts arise spontaneously. They are difficult to detect because they are often quite fast and general. Dysfunctional beliefs in the cognitive structure shape the individual's thoughts and cause cognitive consequences called cognitive errors or distortions specific to psychopathology. Although these cognitive errors are a normal functioning of the mind, they occur more frequently, systematically and inappropriately in mental disorders. In situations where problems occur, these cognitive distortions, which normally occur in everyone, begin to operate more rigidly and inappropriately. Automatic thoughts that are inappropriate for the situation also cause cognitive distortions to occur (14). Internal and external triggers that push a person to use substances also activate cognitive distortions. This situation causes cravings and plans to use substances (15,16).

Findings from epidemiological and treatment studies show that anxiety, depression and substance use disorders often occur together and that the interaction is multifaceted and variable (17). Addressing the coping mechanisms of those struggling with alcohol and substance addiction is an important issue that should not be overlooked. When faced with difficulties, individuals engage in a multidimensional process that involves their thoughts, emotions, and actions. This process aims to reduce the perceived level of stress. Multiple factors, such as cultural background, personal beliefs, available resources, and psychological well-being, can influence it (18,19). If an individual is unable to manage their stress levels, it may impact their ability to cope with their problems and could result in disruptions to their treatment, potentially raising the risk of relapse (20).

These findings highlight the importance of conducting additional research to uncover the intricate connection between substance use, impulsivity, treatment motivation, anxiety, cognitive distortion, and length of stay in the context of substance addiction. Therefore, this study aims to determine the effects of

impulsivity, treatment motivation, anxiety and cognitive distortion on the length of stay in patients receiving inpatient treatment due to substance use.

METHODS

Study Design and Sample

The data of the study were collected between November 2023 and January 2024, after receiving approval from a University Hospital Ethics Committee (ethics committee approval number: HRU/23.23.36). 200 volunteer patients with alcohol and substance use disorders receiving inpatient treatment at the Alcohol and Substance Addiction Treatment Center (AMATEM) were included in this study. Admissions to the alcohol and substance addiction clinic are based on voluntary admission. Patients may be discharged upon the request of the treatment team if they fail to adhere to the clinic's various regulations post-admission. Additionally, individuals may also choose to discharge themselves, even if they comply with the rules. For the general psychopathological evaluation of the participants, the Structured Clinical Interview for DSM-5 (SCID-5) was administered by the clinician. In addition, all participants were given a Case Report Form prepared by the clinician (age, gender, substance use characteristics, etc.), Barratt Impulsivity Scale-11-Short Form, Automatic Thoughts Scale, State and Trait Anxiety Scale, and Treatment Motivation Questionnaire. Semi-structured interviews and scales with the patients were administered before admission (just before the patient was admitted to the ward). Criteria for inclusion in the study; It was defined as being over the age of 18 and under the age of 65, voluntarily applying for alcohol and substance use disorder treatment, being literate, and agreeing to participate in the study after being informed. Exclusion criteria of the study; It was defined as being under the age of 18 and over the age of 65, a history of neurological disease, being illiterate, and mental disability.

Assessment Tools

Case Report Form

In this form, age, gender, marital status, education, employment status, military status, prison and probation history, self-destruction and suicide history, history of psychiatric admission other than substance addiction, family history of substance use, substance use characteristics (preferred substance, duration of substance use, frequency and amount of substance use) and past treatment histories were questioned. At the same time, discharge status and scores obtained from other data collection tools were also stated in the case report form.

Structured Clinical Interview for DSM-5 (SCID-5-CV)

Structured Clinical Interview for DSM-5 (SCID-5-CV) is a semi-structured interview guide developed to establish DSM-5 diagnoses. After obtaining consent to participate in the

study, general psychopathology was determined using the structured clinical interview (SCID) for DSM-V axis I disorders and diagnostic confirmation was made in terms of alcohol and substance use disorders. The Turkish validity and reliability of the scale was conducted by Elbir et al. in 2019 (21).

Treatment Motivation Questionnaire (TMQ): The scale consists of 26 items and is in a 5-point Likert format (Strongly Agree-Strongly Disagree). A Turkish validity and reliability study was conducted and it includes 4 factors: intrinsic motivation, extrinsic motivation, interpersonal help seeking, and confidence in treatment (13).

State-Trait Anxiety Inventory (STAI TX-1, STAI TX-2)

The scale consists of two parts: a 20-item "state anxiety form" created to determine what is felt at the moment, and a 20-item "trait anxiety form" created to determine what has been felt in the last seven days. The scale provides a 4-point Likert-type evaluation (1-not at all, 2-somewhat, 3-very much, 4-completely). In this study, both the state and trait anxiety subscales of the inventory were used. Its Turkish adaptation and validity and reliability studies were conducted by Öner and Compte in 1983 (22).

Barratt Impulsiveness Scale-11-Short Form (BIS-11-Sf)

The scale developed to measure the impulsivity of individuals and was developed by Güleç et al. (2013) adapted it to Turkish and conducted a validity and reliability study (23). The scale consists of a total of 15 items of 4-point Likert type. The scale has three subscales: attentional impulsiveness, motor impulsiveness, and inability to plan impulsiveness. When calculating the scale score, the scores obtained from the items are summed. As the total score increases, the degree of impulsivity also increases.

Automatic Thoughts Scale (ATS)

The scale consists of 30 items and is scored between 1-5. Turkish validity and reliability were conducted by Şahin and Şahin (1992) (24). High total scores from the scale indicate that the individual's negative automatic thoughts occur frequently.

Statistical analysis

Analyzes were evaluated in SPSS (Statistical Package for Social Sciences; SPSS Inc., Chicago, IL) 22 package program. In the study, descriptive data are shown as n and % values in categorical data, and as mean±standard deviation (Mean±SD) and median interquartile range (25-75 percentile values) values in continuous data. The suitability of continuous variables for normal distribution was evaluated with the Kolmogorov-Smirnov test. Kruskal Wallis test was used to compare more than two variables. Spearman correlation test was used to

examine the relationship between continuous variables. In the analyses, the statistical significance level was accepted as $p<0.05$.

RESULTS

200 patients with a median age of 28.0 (25.0-32.0) were included in the study. The participants were all men. 38% of the participants were employed, 58% were married, and 28% were primary school graduates or below. 32% of the patients had a drug-related prison history and 10% had a drug-unrelated prison history. 82% of the participants completed their military service, 8% were exempt and 10% received an unfit report while continuing their military service. While 30% of the participants had a history of suicide, 12% had psychiatric comorbidities.

Table 1. Substance use characteristics of the patients

		n	%
Probation	Yes	104	52.0
	No	96	48.0
Prefered Subtance	Heroin	120	60.0
	Methamphetamine	68	34.0
	Marijuana	4	2.0
	Synthetic Marijuana	8	4.0
Prefered Subtance Duration of Use/year, Median (IQR)		7.0 (4.0-10.0)	
Prefered Subtance Use Quantity/gr, Median (IQR)		2.0 (1.0-3.0)	
Prefered Subtance Usage Frequency	Less than 1 per week	24	12.0
	1-3 Times a Week	20	10.0
	Most of the Week	12	6.0
	Every day	144	72.0
Longest Separation Time From the Substance /Month, Median (IQR)		7.0 (2.0-12.0)	
Additional Substance Use	Yes	144	72.0
	No	56	28.0
Age of Starting Substance, Median (IQR)		19.5 (16.0-23.0)	
Inpatient treatment	Yes	132	66.0
	No	68	34.0
Number of Inpatient Treatments, Median (IQR)		3.0 (1.0-4.0)	
Psychiatric Admission Other Than Substance Use	Yes	52	26.0
	No	148	74.0
Substance Use In the Family	Yes	16	8.0
	No	184	92.0
Length of Stay /day, Median (IQR)		14.0 (6.0-17.0)	
Discharge Status	Remission	92	46.0
	Voluntarily	88	44.0
	Rule of Violation	20	10.0

52% of the patients had a probation history. 60% of the patients used heroin, 34% methamphetamine, 2% marijuana and 4% synthetic marijuana. While 72% of the participants took substances every day, 72% also used additional substances. While 66% of

the patients received inpatient treatment, 26% had psychiatric applications other than substance addiction. 82% of the participants had a family history of substance use. While 46% of the patients were discharged with remission, 44% were discharged voluntarily and 10% were discharged with rule violations (Table 1).

Table 2. Comparison of scale scores according to discharge status

	All Patients (n=200)	Remission (n=92)	Voluntarily (n=88)	Rule of Violation (n=20)	p*
	Median (IQR)	Median (IQR)	Median (IQR)	Median (IQR)	
BIS-T	35.0 (26.0-40.0)	26.0 (23.0-32.0)[a]	39.5 (35.0-46.0)[b]	35.0 (35.0-45.0)[b]	**<0.001**
BIS-NI	12.0 (9.0-15.0)	10.0 (7.0-11.0)[a]	14.0 (12.0-15.0)[b]	15.0 (14.0-17.0)[b]	**<0.001**
BIS-MI	11.0 (9.0-14.0)	9.0 (7.0-11.0)[a]	13.5 (12.0-17.0)[b]	9.5 (9.0-15.0)[a,b]	**<0.001**
BIS-AI	10.0 (9.0-13.0)	9.0 (7.0-10.0)[a]	13.5 (10.0-15.0)[b]	11.0 (9.0-11.0)[a,b]	**<0.001**
STAI-I	50.0 (37.0-57.0)	37.0 (34.0-42.0)[a]	55.0 (52.0-57.0)[b]	60.0 (50.0-61.0)[b]	**<0.001**
STAI-II	48.0 (38.0-56.0)	38.0 (33.0-44.0)[a]	55.0 (49.0-59.0)[b]	54.0 (52.0-57.0)[b]	**<0.001**
ATS-T	87.5 (70.0-106.0)	67.5 (48.0-81.0)[a]	102.5 (95.0-118.5)[b]	106.0 (98.0-117.0)[b]	**<0.001**
TMQ-T	62.5 (45.0-72.0)	63.0 (57.0-69.0)	61.5 (33.0-74.0)	76.0 (42.0-78.0)	0.582
TMA-IM	36.0 (32.0-44.0)	36.0 (34.0-43.0)	36.5 (15.0-42.0)	44.0 (20.0-46.0)	0.627
TMA-HS	14.0 (9.0-17.0)	14.0 (9.0-17.0)	11.5 (6.5-17.0)	14.0 (14.0-17.0)	0.922
TMA-CT	5.0 (3.0-7.0)	4.0 (3.0-6.0)	5.0 (3.0-8.0)	6.0 (4.0-8.0)	0.398
TMA-EM	7.0 (5.0-10.0)	7.0 (4.0-9.0)	7.0 (5.0-10.0)	6.0 (4.0-9.0)	0.477

BIS-T: Barratt Impulsiveness Scale; BIS-NI: Barratt Impulsiveness Scale Nonplanning Impulsiveness.; BD-MI: Barratt Impulsiveness Scale Motor Impulsiveness; BIS-AI: Barratt Impulsiveness Scale Attentional Impulsiveness; STAI-I: State Anxiety Inventory; STAI-II: Trait Anxiety Inventory; ATS-T: Automatic Thoughts Scale; TMQ-T: Treatment Motivation Questionnaire; TMQ-IM: Treatment Motivation Questionnaire Internal Motivation; TMQ-HS: Treatment Motivation Questionnaire Help Seeking; TMA-CT: Treatment Motivation Questionnaire confidence in Treatment; TMQ-EM: Treatment Motivation Questionnaire External Motivation. *Kruskal Wallis analysis was applied.

Significant differences were observed among discharge statuses in terms of BIS-T, BD-NI, STAI-I, STAI-II, and ATS-T scores, which stemmed from the difference between patients achieving remission and those discharged against medical advice or due to rule violation, with the scores of remission patients being lower ($p<0.001$). Significant differences were also noted among discharge statuses in terms of BIS-MI and BIS-AI scores, attributed to the difference between patients achieving remission and those discharged against medical advice, with the scores of remission patients being lower ($p<0.001$). No significant differences were observed among discharge statuses in terms of other scores ($p>0.05$) (Table 2).

A significant negative correlation was observed between length of stay and BIS-T ($r= -0.486$, $p<0.001$), BIS-NI ($r=-0.505$, $p<0.001$), BIS-MI ($r=-0.302$, $p=0.002$), BIS-AI ($r= -0.390$, $p<0.001$), STAI-I (r-0.679, $p<0.001$), STAI-II ($r=-0.598$, $p<0.001$) and ATS-T ($r=-0.668$, $p<0.001$). A positive significant correlation was observed between duration of substance use and BIS-T ($r=0.387$, $p<0.001$), BIS-NI ($r=0.520$, $p<0.001$), BIS-MI ($r=0.301$, $p=0.003$), BIS-AI ($r=0.230$, $p=0.021$), STAI-I ($r=0.452$, $p<0.001$), STAI-II ($r=0.548$, $p<0.001$) and ATS-T ($r=0.211$, $p=0.035$). Negative significant relationships was observed between the longest separation time from the substance and BIS-T ($r=-0.308$, $p=0.002$), BIS-MI ($r=-0.433$, $p<0.001$), BIS-AI ($r=-0.230$,

p=0.021), STAI-I (r=-0.299, p=0.003), STAI-II (r=-0.325, p=0.001) and ATS-T (r=-0.419, p<0.001) (Table 3).

Table 3. Correlation of scales with various parameters

		Length of Stay	Age	Duration of Subtance Use	Subtance Use Quantity	Longest Separation Time From the Substance	Age of Starting Substance	Number of inpatient treatments
BIS-T	r	**-0.486**	0.043	**0.387**	-0.071	**-0.308**	0.041	0.217
	p	**<0.001**	0.668	**<0.001**	0.484	**0.002**	0.683	0.080
BIS-NI	r	**-0.505**	0.017	**0.520**	-0.188	-0.143	0.052	0.226
	p	**<0.001**	0.866	**<0.001**	0.061	0.157	0.610	0.056
BIS-MI	r	**-0.302**	0.085	**0.301**	0.048	**-0.433**	0.137	0.194
	p	**0.002**	0.399	**0.003**	0.632	**<0.001**	0.175	0.118
BIS-AI	r	**-0.390**	-0.024	**0.230**	-0.019	**-0.230**	-0.144	0.072
	p	**<0.001**	0.810	**0.021**	0.849	**0.021**	0.154	0.564
STAI-I	r	**-0.679**	0.078	**0.452**	0.011	**-0.299**	0.024	-0.114
	p	**<0.001**	0.438	**<0.001**	0.917	**0.003**	0.811	0.362
STAI-II	r	**-0.598**	0.138	**0.548**	-0.027	**-0.325**	0.053	-0.148
	p	**<0.001**	0.171	**<0.001**	0.789	**0.001**	0.603	0.235
ATS-T	r	**-0.668**	0.104	**0.211**	0.045	**-0.419**	-.0.032	0.068
	p	**<0.001**	0.302	**0.035**	0.655	**<0.001**	0.749	0.587
TMQ-T	r	-0.002	-0.149	-0.178	0.007	-0.009	-0.118	0.006
	p	0.986	0.139	0.062	0.942	0.928	0.242	0.965
TMQ-IM	r	0.055	-0.165	-0.188	-0.032	-0.115	0.019	-0.072
	p	0.585	0.101	0.061	0.749	0.256	0.854	0.566
TMQ-HS	r	-0.013	-0.044	-0.126	-0.074	0.162	-0.172	-0.045
	p	0.894	0.664	0.213	0.463	0.107	0.087	0.721
TMQ-CT	r	-0.020	-0.036	-0.001	0.106	0.106	-0.183	0.161
	p	0.847	0.725	0.993	0.293	0.295	0.068	0.196
TMQ-DM	r	0.053	-0.095	-0.142	0.057	-0.118	0.068	-0.014
	p	0.600	0.346	0.159	0.573	0.244	0.504	0.914

BIS-T: Barratt Impulsiveness Scale; BIS-NI: Barratt Impulsiveness Scale Nonplanning Impulsiveness.; BD-MI: Barratt Impulsiveness Scale Motor Impulsiveness; BIS-AI: Barratt Impulsiveness Scale Attentional Impulsiveness; STAI-I: State Anxiety Inventory; STAI-II: Trait Anxiety Inventory; ATS-T: Automatic Thoughts Scale; TMQ-T: Treatment Motivation Questionnaire; TMQ-IM: Treatment Motivation Questionnaire Internal Motivation; TMQ-HS: Treatment Motivation Questionnaire Help Seeking; TMA-CT: Treatment Motivation Questionnaire confidence in Treatment; TMQ-EM: Treatment Motivation Questionnaire External Motivation. *Spearman Correlation analysis was applied.

A significant positive correlation was observed between BIS-T score and BIS-NI (r=0.779, p<0.001), BIS-MI (r=0.863, p<0.001), BIS-AI (r=0.830, p<0.001), STAI-I (r= 0.635, p<0.001), STAI-II (r=0.644, p<0.001) and ATS-T (r=0.646, p<0.001). A significant positive correlation was observed between BIS-NI score and BIS-MI (r=0.482, p<0.001), BIS-AI (r=0.455, p<0.001), STAI-I (r=0.548, p<0.001), STAI-II (r=0.530, p<0.001), and ATS-T (r=0.509, p<0.001). Additionally, a significant negative correlation was found between BIS-NI score and TMA-IM (r=-0.200, p=0.047). A significant positive correlation was observed between BIS-MI and BIS-AI (r=0.705, p<0.001), STAI-I (r=0.514, p<0.001), STAI-II (r=0.541, p<0.001), and ATS-T (r=0.566, p<0.001). A significant positive correlation was observed between BIS-AI and STAI-I (r=0.548, p<0.001), STAI-II (r=0.550, p<0.001), and ATS-T (r=0.572, p<0.001). A significant positive correlation was observed

between STAI-I and STAI-II (r=0.833, p<0.001) and ATS-T (r=0.832, p<0.001). A significant positive correlation was observed between STAI-II and ATS-T (r=0.755, p<0.001). A significant positive correlation was observed between TMQ-T and TMA-IM (r=0.877, p<0.001), TMA-HS (r=0.773, p<0.001), TMA-CT (r=0.401, p<0.001), and TMA-EM (r=0.561, p<0.001). A positive significant relationship was observed between TMA-IM and TMA-HS (r=0.557, p<0.001) and TMA-EM (r=0.425, p<0.001). A positive significant relationship was observed between TMA-HS and TMA-CT (r=0.259, p=0.009) and TMA-EM (r=0.341, p=0.001) (Table 4).

Table 4. The correlation of the scores of the scales.

		BIS-T	BIS-NI	BIS-MI	BIS-AI	STAI-I	STAI-II	ATS-T	TMQ-T	TMA-IM	TMA-HS	TMA-CT
BIS-NI	r	**0.779**										
	p	**<0.001**										
BIS-MI	r	**0.863**	**0.482**									
	p	**<0.001**	**<0.001**									
BIS-AI	r	**0.830**	**0.455**	**0.705**								
	p	**<0.001**	**<0.001**	**<0.001**								
STAI-I	r	**0.635**	**0.548**	**0.514**	**0.548**							
	p	**<0.001**	**<0.001**	**<0.001**	**<0.001**							
STAI-II	r	**0.644**	**0.530**	**0.541**	**0.550**	**0.833**						
	p	**<0.001**	**<0.001**	**<0.001**	**<0.001**	**<0.001**						
ATS-T	r	**0.646**	**0.509**	**0.566**	**0.572**	**0.832**	**0.755**					
	p	**<0.001**	**<0.001**	**<0.001**	**<0.001**	**<0.001**	**<0.001**					
TMQ-T	r	0.007	-0.112	0.131	-0.031	-0.066	-0.002	0.021				
	p	0.943	0.268	0.194	0.756	0.516	0.983	0.839				
TMQ-IM	r	-0.073	**-0.200**	0.115	-0.077	-0.081	-0.086	-0.036	**0.887**			
	p	0.471	**0.047**	0.254	0.448	0.421	0.397	0.724	**<0.001**			
TMQ-HS	r	-0.123	-0.162	-0.065	-0.124	-0.193	-0.133	-0.034	**0.773**	**0.557**		
	p	0.222	0.108	0.519	0.219	0.055	0.186	0.733	**<0.001**	**<0.001**		
TMQ-CT	r	0.093	-0.014	0.156	0.054	0.050	0.171	0.163	**0.401**	0.195	**0.259**	
	p	0.359	0.891	0.121	0.597	0.623	0.090	0.105	**<0.001**	0.052	**0.009**	
TMQ-DM	r	0.046	-0.016	0.109	-0.040	-0.093	0.073	-0.094	**0.561**	**0.425**	**0.341**	0.148
	p	0.647	0.874	0.280	0.691	0.360	0.471	0.354	**<0.001**	**<0.001**	**0.001**	0.142

BIS-T: Barratt Impulsiveness Scale; BIS-NI: Barratt Impulsiveness Scale Nonplanning Impulsiveness.; BD-MI: Barratt Impulsiveness Scale Motor Impulsiveness; BIS-AI: Barratt Impulsiveness Scale Attentional Impulsiveness; STAI-I: State Anxiety Inventory; STAI-II: Trait Anxiety Inventory; ATS-T: Automatic Thoughts Scale; TMQ-T: Treatment Motivation Questionnaire; TMQ-IM: Treatment Motivation Questionnaire Internal Motivation; TMQ-HS: Treatment Motivation Questionnaire Help Seeking; TMA-CT: Treatment Motivation Questionnaire confidence in Treatment; TMQ-EM: Treatment Motivation Questionnaire External Motivation.

*Spearman Correlation analysis was applied.

DISCUSSION

In this study, the relationships between impulsivity, treatment motivation, automatic thoughts and anxiety levels, discharge status and substance use characteristics of patients receiving inpatient treatment at the Alcohol and Substance Treatment Center (AMATEM) were examined. The results of this study reveal that there is a relationship between impulsivity scale and subscale scores, automatic thought scale scores, and state-trait anxiety scale scores and discharge status and length of stay.

Individuals with high levels of impulsivity have a higher risk of trying substances and

subsequently developing addiction (25). The instant positive reinforcement (euphoria, relaxation, pleasure, etc.) that occurs after substance use is preferred by individuals over great rewards such as a healthier life, better social life and work life (26). The length of time patients stay in both outpatient and inpatient treatment and complete treatment is also affected by impulsivity. Impulsivity is an important factor in patients discontinuing treatment, remaining abstinent from substances for shorter periods of time, and increasing the risk of relapse (27). In a study conducted on impulsivity and treatment duration, it was concluded that the level of impulsivity was higher in those who stopped treatment early than in those who completed treatment (28). In this study, it was found that individuals discharged voluntarily or due to rule violation exhibited higher levels of impulsivity (across all scales and subscales) compared to those discharged with remission. This study also found a positive relationship between impulsivity and duration of substance use. The correlation between impulsivity and substance use duration suggests that individuals with stronger impulsive drives are more likely to engage in prolonged substance use.

It has been reported in the literature that there is a positive relationship between substance use and anxiety level (29,30). One reason why the anxiety level of addicted individuals is found to be higher than their healthy peers is that when the individual becomes addicted to the substance and becomes aware of his addiction, even attempting to quit substance use or reduce the dose can cause anxiety. Regardless of the severity of withdrawal symptoms of individuals who have stopped using substances, the emergence of these symptoms may contribute to an increase in the level of anxiety (31). Another factor that increases the level of anxiety may be that life without substances creates fear. The anxiety level of the patient who stays away from substances and receives inpatient treatment may increase. This may trigger a desire to end treatment early and shorten the length of stay. In a study, it was found that mental distress was the most obvious precursor to discontinuing treatment in individuals with substance use receiving inpatient treatment (32). In this study, it was found that there was a positive relationship between anxiety level and duration of substance use, and a negative relationship between the longest period of abstinence from the substance. Individuals may turn to the use of the substance in order to reduce their anxiety levels. However, this avoidance mechanism may have the opposite effect over time, and as substance use increases, anxiety levels may tend to increase. Increased anxiety levels can often negatively affect the longest period of separation from substances. This situation is related to the individual's tendency to use substances during periods when he feels

anxious or his efforts to stay away from substances weaken during these periods. Anxiety can be viewed as an escape or coping mechanism for substance use.

In this study, it was found that individuals discharged due to rule violation or voluntarily exhibited a higher frequency of negative automatic thoughts. Substance-related decisions are often automatic and immediate (33). Studies indicate that cognitive errors are observed in individuals before the initiation of substance use (34). These cognitive errors can negatively affect individuals' decision-making mechanisms (e.g., quitting substance use, seeking treatment, adhering to treatment, etc.). Additionally, prolonged exposure to substances can also lead to negative changes in cognition. Yin and Knowlton assert that once substance use behavior is learned, it is guided by negative automatic thoughts (35). In another study, Charles-Walsh et al. reported decreased cognitive control and the involvement of automatic cognitive processes in heroin addiction (36). Additionally in this study, a negative relationship was found between negative automatic thoughts and the longest seperation from the subtances, while a positive relationship was found between negative automatic thoughts and the duration of substance use. Having more negative automatic thoughts may pave the way for the individual to turn to substance use and early termination of treatment in challenging situations (receiving inpatient treatment in a ward, having certain rules, staying away from substances and the social environment, etc.) (37).

One of the unexpected results of this study is that there is no relationship between the treatment motivation total score and subscale scores and the duration of substance use, the longest period of abstinence from the substance, and the length of hospitalization. When patients are evaluated for hospitalization in this clinic, an interview is conducted to ensure that they are willing to quit using the substance completely and to increase their motivation for treatment. In addition, the fact that the treatment motivation questionnaire used as a measurement tool is based on patients' self-report may cause patients to reach high values when filling out the scale. As a matter of fact, in the analyzes made according to the discharge status of the patients, treatment motivation total scores and subscale scores were found to be higher in patients who were discharged voluntarily and with rule violations than in patients who were discharged with remission. Several studies in the literature, similar to this study, concluded that increased treatment motivation may be a factor that makes it difficult for substance addicts to stay in treatment (38,39). On the other hand, the fact that higher treatment motivation was observed in those who were discharged voluntarily and due to rule violations suggests that motivation depends on extrinsic motivation rather than

intrinsic motivation. In other words, this may be due to the fact that individuals who come to treatment due to family pressure do not care about this pressure after a while and leave the treatment voluntarily. Additionally, highly motivated individuals can expect rapid and dramatic recovery. When such expectations are not met, they may become disappointed and lose their commitment to treatment. Additionally, in this study, higher scores in intrinsic motivation, impulsivity, and anxiety were found among individuals discharged due to rule violation or voluntarily. Despite the high level of intrinsic motivation, it was not sufficient for individuals to maintain treatment continuity. Therefore, assisting individuals with high intrinsic motivation in coping with anxious situations they may encounter during inpatient treatment and facilitating the development of adaptive strategies for impulsivity could increase their treatment participation and continuity.

In this study, the relationship between the scale scores was also analyzed statistically. It was determined that there was a positive significant relationship between impulsivity scale and subscale scores, state-trait anxiety scale scores, and automatic thought scale scores. It was determined that there was a negative significant relationship only between the intrinsic motivation scores of the treatment motivation questionnaire and the impulsivity and inability to plan subscale scores.

Negative automatic thoughts can often increase anxiety levels. Negative thought patterns can lead the individual to evaluate events negatively and cause anxiety (40). Individuals with high anxiety levels may feel the need to cope with stress, and in this case, their impulsive behavior may increase. Negative automatic thoughts can also affect an individual's emotional state and trigger impulsive behavior. For example, thoughts such as “I will not be able to get rid of the substance” may cause the individual to feel bad and resort to impulsive behaviors to relieve this emotional state. Individuals with high intrinsic motivation can generally focus on specific goals, develop effective strategies to achieve these goals, and have a more positive course in treatment (13,41). Therefore, strong planning skills may have a positive relationship with intrinsic motivation.

There are a number of limitations in this study. The first of these is that there is no inpatient service for women in this clinic, so all participants are men. Secondly, the fact that the scales used are based on self-report makes the answers to the questions subjective. Thirdly, the universe of the research is limited to being a private center only. Finally, another limitation of the study is the non-utilization of partial regression analysis; this situation may hinder the ability to assess the effects of specific

independent variables (such as length of stay, discharge status, motivation, etc.) independently from other variables, thus potentially limiting a comprehensive understanding of the relationships. The most important strength of this study is that it examines the factors that are thought to affect the treatment duration of individuals with substance use. Thus, new data was provided in order to extend the treatment period of individuals using substances. Another strength is the large sample size and the use of SCID in individual interviews. When the relevant literature was examined, no study was found that addressed the effects of treatment motivation, automatic thoughts, anxiety and impulsivity levels of individuals hospitalized due to substance use on the length of stay. This research contributes to the literature in this aspect. Future studies should consider the possibility of conducting focus group interviews in which participants are encouraged to share openly and freely about themselves. Conducting these studies in a multicenter structure with a larger sample size may increase the generalizability of the results.

CONCLUSION

The results of this research show that there is a relationship between length of stay, discharge status, and some substance use characteristics and impulsivity, automatic thoughts, and anxiety in patients hospitalized due to substance use. In this context, when considering inpatient treatment of patients, it is important to take these factors into account for treatment continuity.

Ethics Committee Approval: The ethical approval for this study was obtained from the Harran University Clinical Research Ethics Committee (ethics committee date and number: 11.12.2023/23)

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