

## Temperamental Characteristics and Problem-Solving Skills among Patients on Opioid Agonists

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### Original Article

#### Abstract

**Background:** The study of temperament and problem-solving styles in people with substance abuse is important in promoting the functions of prevention and treatment of this social problem. Therefore, the aim of this study was to compare the nature and problem-solving skills of methadone treated patients with buprenorphine treated patients.

**Methods:** This study was performed on 62 patients and 54 patients randomly selected for buprenorphine and methadone treatment, respectively. The data was collected using Cloninger's Temperament and Character Inventory (TCI) and the Problem-Solving Questionnaire designed by Cassidy and Long.

**Findings:** Novelty seeking (NS) was higher in patients treated with buprenorphine than those treated with methadone and cooperation was higher in methadone treated patients than those treated with buprenorphine. Moreover, helplessness in patients with methadone treatment was more than those treated with buprenorphine.

**Conclusion:** The study of personality or temperamental characteristics (novelty seeking, cooperation, and etc.) and problem-solving styles in people on buprenorphine and methadone treatment is recommended because it may increase therapeutic success and patients' adherence to treatment.

**Keywords:** Opium addiction; Methadone/Buprenorphine maintenance therapy; Personality characteristics; Problem-solving

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## Introduction

Drug addiction is a recurring and chronic mental illness associated with severe motivational disorders and loss of behavioral domination.<sup>1</sup>

According to the Diagnostic and Statistical Manual of Mental Disorders, 5<sup>th</sup> Edition (DSM-5), the important feature of drug abuse disorder is the existence of one of the cognitive, behavioral, and physiological symptoms which cause individuals to continue using despite significant problems related to drug abuse.<sup>2</sup>

The addiction trend is increasing in countries like China, India, Indonesia, Russia, Malaysia, Pakistan, Iran, and many other countries all around the world; its global health burden has been estimated to be around 0.7% in recent years.<sup>3</sup>

Therefore, addiction has become a major concern for policymakers and has become a main public health issue which requires appropriate interventions and programs.<sup>4</sup>

Researchers in the field of addiction believe that certain temperamental features have a role in the onset, formation, and continuity of drug dependence and it seems that certain personality dimensions' act as risk factors, formation and progression outcomes, and causes of substance abuse disorder and personality disorder. The psychological-temperamental characteristics of drug addicts are not merely due to narcotics; in fact, these addicts have a history of several psychological and personality disorders before addiction, but they appear more destructively after drug abuse. Therefore, the addict's concern is not only the drug itself, but also the mutual relationship between his personality and addiction.<sup>5</sup>

Different models have been proposed to evaluate people's personality traits. Cloninger (2004 and 2006) is a personality bio-theorist who, considering and emphasizing the biological foundations of personality, has created a solid theoretical framework in the two fields of temperament and character. In his viewpoint, the concept of temperament refers to individual differences in the context of basic emotional responses and is in fact inherited features that remain stable and unchanged throughout life. On the other hand, the character (which may be mature or immature) reflects the individual's life goals, value system, and conscious emotions, but

its dimensions are less inherited and are often influenced by social learning.<sup>6</sup>

In Cloninger's viewpoint, the temperament consists of four dimensions including novelty seeking (NS), harm avoidance (HA), reward dependence (RD), and persistence (PS). Novelty seeking is associated with a system of behavioral activation or reward dependence system, harm avoidance with a behavioral preventive system or punishment, reward dependence with social reinforcement, sensitivity to stimuli, and persistence in maintaining certain behaviors in silent conditions. In Cloninger's biological viewpoints, temperament includes the three aspects of self-directiveness (SD), cooperativeness (C), and self-transcendence (ST). Self-directiveness is the capacity of regular conduct in order to be consistent with the individual's principles, goals, and beliefs. Cooperativeness involves community-friendly behaviors as an indicator of social adjustment. Self-transcendence is the ability to accept and perceive oneself and the environment as an integrated whole. The combination and integrity of dimensions of temperament and character lead to the formation of a sociobiological theory of personality.<sup>7</sup>

Another key issue related to substance abuse is paying attention to the skills that enable people to deal with problems. Some studies have shown that addicted people have some difficulties in the skills necessary to cope with problems, and thus, consider drug abuse as a way of coping with problems so as to decrease undesirable emotions resulted from difficult intrapersonal or interpersonal situations. Problem-solving skill is one of the factors determining the effects of negative life events and refers to the attitudes, skills, and abilities that enable an individual to choose an effective and adaptive solution to any life problem.<sup>8</sup>

Problem-solving skills training is a kind of short-term psychological intervention that can be used alone or in conjunction with other therapeutic approaches and refers to a cognitive-behavioral process that provides a variety of alternative and potential responses to deal with problematic situations. It also increases the possibility of choosing the best and the most effective responses. In fact, this skill requires special targeted strategies by which one defines his life's problems, decides on solutions, and uses

problem-solving strategies and monitors these strategies.<sup>9</sup>

Different researches have shown a negative relationship between addiction and the problem-solving skill. Their findings revealed that addicted people have lower problem-solving abilities.<sup>10</sup>

The problem-solving process provides a variety of potentially effective responses to deal with problematic situations and increases the probability of choosing the most effective response from among these alternate solutions. Social problem-solving training can manage critical needs, expression skills, and conflict-solving skills and can increase social, communication, self-efficacy, and self-management skills. Social problem-solving skills training in people who have difficulty in self-control skills is an effective way to manage their problems.<sup>11</sup>

Problem-solving skills training not only improves the individuals' self-efficacy,<sup>12</sup> but also minimizes defects in response preventative problems; in other words, inefficient problem-solving methods can increase high risk behaviors.<sup>13</sup>

In general, it is important to examine personality traits and problem-solving skills among people with substance abuse in order to promote preventive measures and treatment of this social problem. Studies conducted by researchers have shown that few studies have evaluated "addiction" from two main aspects, namely, personality traits and problem-solving skills. Moreover, various treatments can have their own psychosocial pathologies. Thus, the aim of this study was to compare temperamental features and problem-solving skills simultaneously in patients treated with methadone and patients treated with buprenorphine in Kerman, Iran.

## Methods

This was a cross-sectional study with subjects randomly selected from among individuals referring to the methadone center of Psychiatric Hospital of Kerman in Southeastern Iran during the past 3 months. The participants consisted of 62 (47 men and 15 women) and 54 (46 men and 8 women) patients treated with buprenorphine and methadone, respectively.

The study inclusion criteria included continuous substance abuse for more than 2 years

(through consumption or inhalation) and deliberately leaving the study in each section. Individuals who did not have the criteria for opium dependence according to the DSM-5, or those who abused drugs as a hobby or for the purpose of testing were not included in the study.

Cloninger's Temperament and Character Inventory (TCI) and the Problem-Solving Questionnaire by Cassidy and Long were used to collect information. The TCI-125 contains 125 questions and 2 dimensions of temperament and character with a total of 7 subscales including NS, HA, RD, PS, C, SD, and ST. The psychometric properties of Cloninger's TCI were analyzed by Kaviani and Poor Naseh in 2005. The retest reliability of this inventory after 1 to 2 months was limited to 0.73 for the dependent remuneration scale and 0.90 for the self-esteem scale. Moreover, Cronbach's alpha coefficient ranged from 0.55 for perseverance to 0.84 for the self-steering scale.<sup>14</sup> The Problem-Solving Questionnaire was developed by Cassidy and Long in two steps. This scale includes 24 questions to measure 6 factors, each of which include 4 test items. These factors include distress in problem-solving or orientation, problem-solving inhibition or control, creative problem-solving styles, and trust in problem-solving, avoidance style, and access or approach style. The distress, inhibition, and avoidance styles are unconstructive problem-solving sub-scales and the styles of approach, creativity, and trust are constructive problem-solving sub-scales.<sup>15</sup>

Data were analyzed using descriptive statistics including frequency, frequency percentage, mean, and standard deviation (SD); in addition, the independent t-test was used to compare mean scores between the two groups. The analyses were performed using SPSS software (version 20, IBM Corporation, Armonk, NY, USA) with a significance level of 0.050.

## Results

According to the results of data analysis, 22 (35.5%), 25 (40.3%), and 15 (24.2%) patients treated with buprenorphine were below 30, 30-40, and 40 and higher years of age, respectively. Moreover, 12 (22.2%), 19 (35.2%), and 23 (42.6%) patients under methadone treatment were in the age range of below 30, 30-40, and 40 and higher years of age, respectively.

**Table 1.** Comparison of the temperament-character personality traits among patients undergoing methadone and buprenorphine treatments

Statistical index dimensions	Group	Number	Mean ± SD	P
<b>Temperamental traits</b>				
NS	Treated with buprenorphine	62	10.50 ± 2.65	0.016
	Treated with methadone	54	9.25 ± 2.82	
HA	Treated with buprenorphine	62	9.91 ± 2.76	0.654
	Treated with methadone	54	9.68 ± 2.85	
RD	Treated with buprenorphine	62	7.61 ± 1.81	0.263
	Treated with methadone	54	8.05 ± 2.41	
PS	Treated with buprenorphine	62	3.32 ± 1.05	0.548
	Treated with methadone	54	3.30 ± 1.07	
SD	Treated with buprenorphine	62	9.97 ± 5.03	0.419
	Treated with methadone	54	10.38 ± 4.31	
C	Treated with buprenorphine	62	13.50 ± 3.47	0.026
	Treated with methadone	54	14.90 ± 3.21	
ST	Treated with buprenorphine	62	9.74 ± 3.21	0.345
	Treated with methadone	54	9.18 ± 3.08	

NS: Novelty seeking; HA: Harm avoidance, RD: Reward dependence; PS: Persistence; SD: Self-directiveness; C: Cooperativeness; ST: Self-transcendence; SD: Standard deviation

The independent t-test was used in order to compare the temperament-character personality traits among patients undergoing methadone and buprenorphine treatments. The results of the test are presented in table 1.

The comparison of the mean temperament-character traits of patients undergoing methadone treatment and buprenorphine treatment showed a significant difference in the mean of NS and C between the two groups ( $P < 0.050$ ) (Table 2). Comparison of the mean values indicated that NS was higher among patients treated with buprenorphine compared to those treated with methadone; in addition, C among patients treated with methadone was higher in comparison to patients treated with buprenorphine.

Comparison of the mean of problem-solving skills showed that mean distress among patients treated with methadone was significantly different from that of the patients treated with buprenorphine ( $P < 0.050$ ). Comparison of the mean values indicated that distress was higher among patients treated with methadone compared to those treated with buprenorphine.

### Discussion

The comparison of the mean temperamental-characteristic personality traits showed that novelty seeking was higher in patients treated with buprenorphine than in patients treated with methadone and cooperativeness was higher in patients treated with methadone compared to those treated with buprenorphine.

**Table 2.** Comparison of problem-solving skills among patients undergoing methadone and buprenorphine treatments

Statistical index	Group	Number	Mean ± SD	P
<b>Dimensions of temperamental traits</b>				
Distress	Treated with buprenorphine	62	1.630 ± 1.187	0.0
	Treated with methadone	54	2.170 ± 1.437	
Inhibition	Treated with buprenorphine	62	1.450 ± 1.060	0.2
	Treated with methadone	54	1.690 ± 1.060	
Creativity	Treated with buprenorphine	62	1.440 ± 1.215	0.1
	Treated with methadone	54	1.060 ± 1.262	
Trust	Treated with buprenorphine	62	1.660 ± 1.292	0.1
	Treated with methadone	54	1.320 ± 1.120	
Avoidance	Treated with buprenorphine	62	1.180 ± 1.170	0.7
	Treated with methadone	54	1.250 ± 1.192	
Access	Treated with buprenorphine	62	0.967 ± 1.227	0.4
	Treated with methadone	54	0.796 ± 1.155	

SD: Standard deviation

The findings of the present study are in agreement with the results of the study by Kimayee et al.<sup>16</sup>

However, these findings are in contrast with the results of the study by Pournaghash-Tehrani and Hassantash.<sup>17</sup> In this study, no significant difference was found in the NS subscale between drug-dependent and healthy individuals. This difference in the results was attributed to the culture of the Iranian people, and that NS plays a minor role in the development of addiction.<sup>17</sup>

Regarding the explanatory findings, it can be stated that cooperativeness is a characteristic aspect of personality which is related to social adjustment and compliance with social norms. In fact, cooperativeness is based on the assumption of self as part of the human world and society. According to the findings, since patients undergoing methadone treatment are less vulnerable compared to patients treated with buprenorphine, they have stronger skills in this dimension such as collaboration, compassion, conscience, and desire for charity. It is also noteworthy that low levels of cooperativeness among addicts treated with buprenorphine has many theoretical and practical implications: people may be incapable of following and complying with the norms of the community, so they show less sense of cooperation. By consuming buprenorphine, these people try to suppress their unpleasant personality traits or to increase their level of socialization and their needs for being approved by others. With respect to the results of novelty seeking in patients treated with buprenorphine, it can be mentioned that higher novelty seeking was significantly associated with consumption of more stimuli and motivation to earn a positive reward, while low levels of novelty seeking was related to the consumption of more sedative substances and incentives related to avoiding negative emotions in life.

The comparison of the mean problem-solving skills between patients undergoing methadone and those treated with buprenorphine showed that helplessness was higher in patients treated with methadone than in patients treated with buprenorphine. Findings of the present research were consistent with the results of the study by Mirmohdi and Moradi.<sup>18</sup> However, these findings are not consistent with the results of the study by Yavari and Arefi on the assessment of problem-

solving skills in the two substance-dependent and substance-independent groups.<sup>19</sup> According to this study, identifying some ways other than problem-solving skills to correct the destructive effects of addiction was of great importance.<sup>19</sup>

In their study, Habibi et al. reported the beneficial effects of problem-solving training on improving self-efficacy, self-esteem, and self-respect and on reducing the recurrence of consumption during the treatment period.<sup>20</sup> Based on the findings of his study, "helplessness and avoidance" patterns were observed more in people undergoing methadone due to its greater effects. One of the negative effects of these substances was that people using them could not solve their problems; therefore, their unsolved problems increased. As their problems increased, helplessness increased and deteriorated the situation of people treated with methadone. It is also worth noting that these people have a negative attitude toward life issues and are less willing to deal with problems. In problematic situations, they feel lonely, hopeless, and fatigued, experience negative emotions and psychological pressure from other people and other pernicious environmental factors, and they take the least advantage of their personal and social resources to solve their problems.<sup>20</sup> Therefore, "helplessness and loneliness" patterns may be more highlighted in people undergoing methadone than in those treated with buprenorphine.

One of the limitations of this study was that the study criteria were not investigated before the patients took part in the study and that the temperamental features were not examined in the patients' family members. Therefore, the impact of drugs on these criteria cannot be analyzed. Another limitation was failure to compare the study criteria with patients' demographic features and to examine their psychiatric disorders.

The most important positive point of this study was that it examined patients' temperamental features and problem-solving skills simultaneously. In addition to the above-mentioned issues, it is recommended that greater populations be included in future studies.

## Conclusion

Novelty seeking was higher in buprenorphine treated people; therefore, they showed inability to comply with the norms of the society. Thus, they

were less likely to have a sense of cooperation. Moreover, low novelty seeking was related to the consumption of more sedatives such as methadone. The present findings are important for preventive planning. Personality profiles can be used to screen young people in order to identify them and to decrease the risk of substance abuse through timely interventional programs.

Unlike buprenorphine-treated people, people undergoing methadone showed more cooperation and used more problem-solving methods in "loneliness and helplessness" situations. Therefore, in rehabilitation and treatment

programs designed for such patients, paying attention to these criteria may increase therapeutic success and patients' adherence to treatment.

### Conflict of Interests

The Authors have no conflict of interest.

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## بررسی و مقایسه ویژگی‌های سرشتی و مهارت حل مسأله در بیماران تحت درمان متادون و بوپرنورفین

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### مقاله پژوهشی

### چکیده

**مقدمه:** بررسی ویژگی‌های شخصیتی و سبک‌های حل مسأله در افراد مبتلا به سوء مصرف مواد، از جنبه ارتقای عملکردهای پیشگیری و درمان این معضل اجتماعی حایز اهمیت فراوانی است. بنابراین، هدف از انجام پژوهش حاضر، مقایسه ویژگی‌های سرشتی و مهارت حل مسأله در بیماران تحت درمان متادون و بیماران تحت درمان بوپرنورفین بود.

**روش‌ها:** این مطالعه بر روی ۶۲ بیمار تحت درمان بوپرنورفین و ۵۴ بیمار تحت درمان متادون که به صورت تصادفی انتخاب شده بودند، انجام گرفت. داده‌ها با استفاده از پرسش‌نامه ویژگی‌های سرشتی - منشی شخصیت Cloninger، مقیاس شیوه‌های حل مسأله Cassidy و Long و اطلاعات دموگرافیک جمع‌آوری گردید.

**یافته‌ها:** نوجویی در بیماران تحت درمان بوپرنورفین بیشتر از بیماران تحت درمان با متادون بود و همکاری در بیماران تحت درمان متادون بیشتر از بیماران تحت درمان بوپرنورفین مشاهده شد. همچنین، درماندگی در بیماران تحت درمان متادون بیشتر از بیماران تحت درمان بوپرنورفین بود.

**نتیجه‌گیری:** توصیه می‌شود در افراد تحت درمان نگهدارنده با آگونیسست‌ها، ویژگی‌های شخصیتی و سرشتی (نوجویی، همکاری و...) و روش‌های حل مسأله بررسی شود؛ چرا که ممکن است موفقیت درمانی و ماندگاری آن‌ها در درمان را افزایش دهد.

**واژگان کلیدی:** وابستگی به مواد مخدر، درمان نگهدارنده با متادون / بوپرنورفین، ویژگی‌های سرشتی، حل مسأله

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