

Cognitive performance and social support in patients under maintenance therapy

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Abstract

Context: Due to its destructive nature for the health of individual and society, the phenomenon of addiction has always been a worrying social problem. Thus, addiction is an issue of importance for the researchers and social planners.

Aims: The purpose of this research was modeling the structural equation modeling (SEM) between craving and psychological trauma through the intermediating role of cognitive performance and social support in patients under maintenance therapy.

Settings and Design: This is a descriptive analytic study. All patients undergoing maintenance therapy in outpatient departments of Sari in 2018 were evaluated.

Material and Methods: This research was descriptive of SEM type, in particular, regression equations type. The research population consisted of patients undergoing maintenance therapy in addiction treatment centers ($n = 9200$) in Sari in 2017. According to the inclusion criteria, 400 samples were selected using simple random sampling. Questionnaires of craving, psychological trauma, cognitive performance, and social support were used.

Statistical Analysis Used: Data were analyzed using SEM and in particular regression equations. SPSS and AMOS were used for the analysis of the collected data.

Results: The results of the study showed that the amount of direct effect of craving on the psychological trauma was equal to 0.330, the indirect effect of craving on psychological trauma through cognitive performance was equal to 0.001, and the total effect was equal to 0.331. Given that the P value for the indirect path was >0.05 and for direct paths and total effect was <0.05 , the effect of mediating the cognitive performance variable on the relationship between craving and trauma was not meaningful. Moreover, the amount of direct effect of craving on the trauma was equal to 0.316, the indirect effect of craving on trauma (through social support) was 0.013, and the total effect was equal to 0.329. Considering that the P value for the indirect path was >0.05 and was <0.05 for direct paths and the total effect, the impact of mediating the social support variable in the relationship between craving and trauma was not significant.

Conclusion: Considering the direct predictive power of variables, the results of the present study could be used in the therapy of drug addiction and patient education in relation to addicted patients.

Keywords: Cognitive performance, Craving, Patients under maintenance therapy, Psychological trauma, Social support

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INTRODUCTION

Addiction, as one of the 21st century crises, is one of the health, psychological, and social problems, as well as the most important factor in creating high-risk behaviors that have affected all societies. It is a public health problem worldwide and in all countries.^[1] The most common psychiatric disorder associated with addiction includes major depressive disorder, alcohol abuse, antisocial personality, and anxiety disorder. Moreover, 15% of opioid addicted people have a history of at least one suicide.^[2,3] Another important variable that affects substance abuse is cognitive performance. The result of a study indicated the existence of a disorder in the cognitive system of drug users.^[4] Deep cognitive decline in the researches on the use of chronic stimulant drugs such as cocaine and amphetamine and morphine or heroin were reported.^[5,6] Therefore, it can be argued that chronic consumption of psychoactive substances caused damages to the multiple brain regions, such as the prefrontal cortex and the hippocampus, and thus disrupted the cognitive performances of these areas.^[7] Various studies have suggested that drug use affected cognitive performance. In this regard, von Geusau *et al.*, in the separate researches, have shown that cognitive flexibility was disrupted in the drug abusers and increased the behaviors of preservation.^[8] Yan *et al.* (2014) suggested that the heroin-dependent addicted people showed lower performance in working memory assignments compared to the control group.^[9] Chronic consumption of psychedelic material caused damages to the multiple brain regions, such as the prefrontal cortex and the hippocampus, resulting in impairment in cognitive performance.^[7] Another important variable that affects addiction is social support. The result of a research showed that there was a significant relationship between social support and psychological health.^[10] Satisfaction with social support reduced anxiety, depression and overcoming disease, and increased self-confidence and developed social relationships.^[11] Moreover, receiving social support can reduce stress and its negative effects.^[12] Social support is one of the most important predictors of physical and psychological health. Researchers considered social support as one of the most important predictors of physical and psychological health from childhood to adolescence.^[13] Findings showed that there was a positive correlation between family support and better life for addicted people.^[14] Considering the importance of the experience of craving for the continuity of addiction in many researches have been approved in many researches, given the increasing use of methadone maintenance therapy for the abandonment of substance abuse, investigating craving in people under therapy and those under therapy with methadone becomes necessary.^[2] Therefore, the purpose of this study was modeling the structural relationships between

craving and psychological trauma with the intermediary of cognitive performance and social support in addicted people under maintenance therapy. It is hoped that the results of the present study be a good source for patients who are taking drugs to improve their psychological health and life quality.

MATERIAL AND METHODS

According to its purpose, this research was an applied research. In terms of collecting data, this was a cross-sectional and analytical study using descriptive method and a structural equation modeling (SEM), in particular, regression equations. It was a covariance-based approach which estimated the path coefficients of factor loads through minimizing the difference between a sample-based covariance matrix and a model-based covariance matrix. Data were collected using SPSS (SPSS Inc., Chicago, Ill., USA) and AMOS, version 23 (AMOS 23.0.x., IBM, SPSS Inc., Chicago, Ill, USA). In this study, a population of all addicted people (opium and stimulant addiction) who had been treated for 1–6 months in the age range of 18–70 years ($n = 9200$) was studied in the clinics of Sari. The statistical population of this research consisted of all addicted people in the improvement of 95 addiction treatment centers in Sari. The selection of centers was based on random numbers table and homogeneity of the population in terms of the variables such as drug abuse, craving, use of methadone, and so on. At first, 32 centers were randomly selected from among 95 centers, and in each center, approximately 13 patients were selected as samples using simple random sampling. These centers were all homogeneous in terms of the studied variables and were not affected by the special therapy center. On the other hand, the number of items was 91. According to the researchers' suggestions, in this case, it would be better to have a sample size of at least four times more than the number of items, thus 364 samples were obtained, which was assumed to be 400 samples.^[15] In the area of implementation, after obtaining a research license from the university's research departments, deputy director of therapy and clinics, the selection of research samples and explanation of the goals of the study were done. The ethics code that received from the Deputy of Research and Technology is IR.IAUSARI.REC.1398.002.

Inclusion criteria for participating in the study

The criteria for participating in the study included patients who were resident in Sari for 1 year, being male with the age range of 18–70 years, not having acute psychological disease, no poisoning, ability to understand the protocol of research and follow the simple guidelines, willingness to write their signature, informed consent of patients who were not able to read or write. They were assured that, given the namelessness of the questionnaires, the information

and their answers would be completely confidential. The written consent was taken from them.

Exclusion criteria

Incomplete completion of questionnaires, lack of truthfulness or accuracy in questionnaires, also people having severe chronic physical disease, disability to cooperate, or psychological problem excluded them from the study.

Methodology and instruments use for data analysis

In this research, the structural regression equation modeling was used to analyze the obtained information. This method is one of the main methods for analyzing the complex data structure and one of the methods for investigating causal relationships. This means analyzing the various variables that show the simultaneous effects of the variables in one theoretical structure. Through this method, the appropriateness of theoretical models in specific populations using solid, nonexperimental, and experimental data could be tested. Modeling structural models is a very comprehensive and powerful multivariate analysis of multivariate regression family that allows the researcher to test a set of regression equations simultaneously. Modeling is a comprehensive approach for testing hypotheses about the relationships between observed and hidden variables, sometimes referred to as structural analysis of covariance or causal modeling.^[15] SPSS, version 22, and Amos 23 software were used to analyze the data.

Data collection instrument and its usage method

Demographic characteristics questionnaire

The questionnaire includes variables such as age, sex, marital status, level of education, occupation, and type of medicine.

Instantaneous drug craving questionnaire

The Desire for Drug Questionnaires is centered on craving as a mode of stimulation (in the present). The questionnaire contains 13 questions and is based on the 7-option Likert scale (I totally disagree to I fully agree). Scoring is from 1 to 7. The answer I totally disagree has the score 1 and I totally agree has the score of 7. It measures the three main factors of craving, namely, the desire and intention of consumption, negative reinforcement, and control. The first factor is the desire and intention to consume the drug which includes the questions,^[1,2,4,6,9,12,13] the second factor is the negative strengthening or belief in solving the problems of life and gaining pleasure while consuming drugs that include questions 5, 8, 10, 11 and the third factor comprehends the pleasure and the severity of the lack of control that covers questions 3 and 7. These

three components are highly correlated. The internal consistency of the components of this questionnaire in the study of Mokri *et al.* (2008) was 0.89, 0.79, among abusers of various types of opioids, including crack and heroin, respectively. Regarding the abusers of methamphetamine, it was equal to 0.78.^[16] In addition, the internal consistency with Cronbach's alpha for the three main factors was 0.81, 0.85, 0.84, and the reliability of the three factors of the questionnaire in the retest were confirmed (0.81, 0.84, and 0.85, respectively).^[17]

Psychological trauma questionnaire (SCI-25)

In this research, Scl-25 scale, as the shorted form of Scl-90-R, was used to measure the psychological health. This questionnaire measures psychopathological problems of an individual whose main factors are: physical complaints, practical compulsive obsession, interpersonal sensitivity, depression, aggression, anxiety, phobias, paranoid thoughts, and psychosis. The short form of the scale was standardized in a sample of Ahvaz University students. The correlation between the 25-question and 90-question scale was 95%, and all correlation coefficients of SCl-25 with nine dimensions and additional items of Scl-90-R were statistically significant at $P < 001$ level. Therefore, the 25-point scale had a high correlation with 90-item scale and was a valid scale for measuring trauma.^[18] In the present research, 25-question scale was used to measure each item in terms of Likert spectrum (in five categories of no, low, partially, very, and severely). Lower scores suggested lower psychological health, and earning scores above 65 indicated a person suspected of having a psychological disorder. The reliability coefficient based on the Cronbach's alpha coefficient was 93%, which indicated a very intense internal matching between the proposed items in the scale.^[19]

Social support scale of Zimet et al.

Multidimensional social support scale has 12 assumed items: the family assumed support (4 items), friends (4 items), and other important people (4 items). The items are measured on a 5-point Likert scale (1 = I totally disagree to 5 = I absolutely agree). The maximum and minimum score varies between 60 and 0, and the high score reflects the individual's assumed social support.

Several studies have shown that this scale enjoys intrinsic coefficients and appropriate retest. The coefficients of Cronbach's alpha reliability of the multidimensional scale of assumed social support for the whole scale were 0.93 and for the family social support scale was 0.91, for friends was 0.98 and for others, it was 0.91. Another study showed that the coefficients of reliability of the total scale were

0.88, and for the three subscales, it varied from 0.80 to 0.90. In the other study, the Cronbach's alpha coefficient was reported as 0.85.^[20,21]

Cognitive performance evaluation questionnaire

This questionnaire is the most commonly used cognitive disorders screening instrument in the world, translated into various languages and standardized in many different ways. This test is short and it can be performed in 10 min or less. The test for screening cognitive impairment is a commonly used instrument since it shows the changes in intelligence over time and indicates the potential effect of therapeutic factors on cognitive functions. The cognitive areas being evaluated by this questionnaire include orientation (10 questions), words (3 questions), attention and calculation (5 questions), short-term memory (3 questions), various language functions (3 questions), and spatial-visual thinking (6 questions). The questionnaire has 30 questions and the total score of that is 30 scores; the score <23 indicates the probability of cognitive impairment. Each correct answer has one score, and the range of scores for each subject varies from 0 to 30. The degree of internal consistency and reliability of the items has been obtained by the use of the Cronbach's alpha coefficient.^[22]

RESULTS

In Table 1, the participant's demographic characteristics have been shown. The highest age of addicted people was between 61 and 70 years old including 98 individuals (28.5%) and the youngest age under 20 included 15 (3.75%) individuals. In terms of marital status, the majority of married persons were 308 (77%) and the lowest death rate of spouse included 17 (4.25) individuals. Most of the illiterate people were 125 (31.25%), most of the farmers were 147 (36.75%), and most of them (204) used methadone (51%).

As shown in Table 2, the standard path coefficient of the craving variable on the trauma was equal to 0.12, *t* value was equal to 2.212, and the *P* < 0.05. As a result, the craving had a significant and positive effect on psychological health. The coefficient of the standard path of craving variable for social support was equal to -0.15, the *t* value was -2.317, and the *P* < 0.05. As a result, craving had a significant and negative effect on social support. The coefficient of the standard path of craving variable for cognitive performance was 0.3, *t* value was equal to 0.558, and the *P* > 0.05. As a result, craving did not have a significant effect on cognitive performance. Normality of data was checked using the Kolmogorov-Smirnov one-sample test.

The amount of direct effect of craving on psychological trauma was 0.033, the indirect effect of craving on trauma through (path) cognitive performance was equal to 0.001, and the amount of total effect was equal to 0.331. Considering that the *P* value for the indirect path was >0.05 and for direct paths and total effect was <0.05. Therefore, the effect of mediating the cognitive function variable on the relationship between craving and psychological trauma was not significant. The amount of direct effect of craving on the psychological trauma was equal to 0.316, the indirect effect of craving on psychological trauma (through social support) was 0.013, and the total effect was equal to 0/329. Considering that the *P* value for the indirect path was >0.05 and for the direct paths and the total effect was <0.05, the indirect mediation effect of the social support variable in the relationship between craving and trauma was not significant [Tables 3 and 4].

Table 1: Demographic characteristics of study participants

Variables	Set	Frequency (%)
Age	<20	15 (3.75)
	21-30	46 (11.5)
	31-40	75 (18.75)
	41-50	71 (17.75)
	51-60	95 (23.75)
	61-70	98 (24.5)
Marital status	Married	308 (77)
	Single	38 (9.5)
	Divorced	37 (9.25)
	Death of spouse	17 (4.25)
Education	Illiterate	125 (31.25)
	Under diploma	96 (24)
	Diploma	87 (21.75)
	Undergraduate	65 (16.25)
	MSc and above	27 (6.75)
Occupation	Farmer	147 (36.75)
	Technician	45 (11.25)
	Employee	57 (14.25)
	Free	97 (24.25)
	Retired	54 (13.25)
Medicine	Methadone	204 (51)
	Buprenorphine	92 (23)
	Opioid syrup	104 (26)

Table 2: Path analysis of model of relations between variables

Direct relations between variables of model	Standard coefficient	<i>t</i>	<i>P</i>
Craving and trauma	0.012	2.212	0.027
Craving and cognitive performance	0.03	0.558	0.557
Craving and social support	0.015	-2.317	0.021

Table 3: Mediating role of cognitive performance and social support between craving and psychological trauma

Variables	Direct effect	Indirect effect	Total effect	Direct <i>P</i>	Indirect <i>P</i>	Total <i>P</i>
Relation of craving to the cognitive performance and social support	0.0330	0.0001	0.331	0.001	0.0048	0.001
	0.316	0.013	0.329	0.001	0.0077	0.0001

Table 4: The fitness indexes of the main research model

Indexes	Acceptable value	Research findings	Desirability
χ^2	-	3988.567	Model approved
P	-	0.000	Model approved
df (degree of freedom)	df ≥ 0	14.4	Model approved
χ^2 / df	$\chi^2 / df < 3$	2.841	Model approved
RMSEA	RMSEA $< 1/0$	0.068	Model approved
NFI	NFI $> 8/0$	0.832	Model approved
AGFI	AGFI $> 8/0$	0.683	Model not approved
GFI	GFI $> 8/0$	0.711	Model not approved
CFI	CFI $> 8/0$	0.859	Model approved
IFI	IFI $> 8/0$	0.860	Model approved
SRMR	The closer to zero	0.080	Model approved

RMSEA: Root mean square error of approximation, NFI: Normed fit index, AGFI: Adjusted goodness of fit index, GFI: Goodness of fit index, CFI: Confirmatory fit index, IFI: Incremental fit index, SRMR: Standardized root mean square residual

DISCUSSION

The purpose of this research was to investigate the relationship between the craving and the psychological trauma with mediating cognitive performance and social support in patients undergoing therapy (amphetamine, buprenorphine, and opioid syrup). The results of this research indicated that craving was not associated significantly with the trauma with mediating cognitive performance in patients undergoing the therapy. Patients affected by drugs and taking medication had low trauma and weak cognitive performance. The result of this research was consistent with the findings oriented to the relationship between cognitive performance and psychological trauma in people under the influence of drugs.^[14,23-25,26] The reason why these patients did not have a cognitive and psychological problem was clear and obvious because they were influenced by the drug. However, the result of this study was not consistent with those conducted by other studies.^[6,9,10,27-29] The reason for this was that the above studies were conducted about the drug addicted people who were not either under medication or therapy or did not receive regular therapy. However, the present study dealt with the patients who were under therapy. Regarding patients affected by the drug, these studies suggested that defects in the performance of the abusers were due to the damage to the cerebral cortex. For example, the animal and human studies have shown low levels of the ventricular side of the prefrontal cortex.^[30] Some studies have also suggested that the lower forehead fracture and its connections to the basal ganglia components were related to the change in the location of the Wisconsin test assignments.^[31] In explaining this finding, some recent theories suggested that chronic consumption of narcotic drugs was associated with brain regions involved in memory and learning similar to the frontal cortex and hippocampus.^[32] Craving is a strong and resistant desire toward using drugs. If

this desire is not met, some psychological and physical sufferings occur, including weakness, anorexia, anxiety, insomnia, aggression, and depression.^[2,33] An increase in verbal memory, performance, focus and attention, cognitive adjustment, and uncontrolled response was confirmed in various researches.^[5,6] The most common psychiatric disorders associated with addiction include major depressive disorder, alcohol consumption disorder, antisocial personality, and anxiety disorder; 15% of opioid addicted people had a history of at least one suicide.^[3] A study was examined by Arefnasab *et al.* in this regard (2005). The results of the present study showed that people under the influence of care had good psychological health.^[23] A study also showed that the therapy was effective in reducing drug craving.^[24] Patients taking methadone had a positive effect on the mood of patients.^[25]

The result of this research showed that craving had a direct and significant effect on social support.

These findings were in line with various studies.^[10,11,17] The satisfaction of social support reduces anxiety, depression, overcoming hypochondriasis, increasing self-confidence, and expanding social relationships.^[11] Social support played a role in vulnerability and people's coping with the stress, as well.^[13] A study showed that the addicted people with less social support faced many difficulties.^[12] Researchers considered social support as one of the most important predictors of physical and psychological health from childhood to adolescence.^[13] The social support referred to the quality of communication with others that provided resources when needed and made a person feel caring, belonging, and worthy.^[30] Social support can be a good predictor of a return to addiction.^[32] However, the relationship between craving and psychological trauma with social support mediation was not meaningful. Comparing social protection and psychological trauma among healthy people and people with headache, Teoh and Tam found

that healthy people had higher levels of social protection and psychological health than patients.^[6,34-36] Based on the findings of a research, the addicted people had less social support compared to the nonaddicted or improved people.^[37] Social support between people without return and with return to addiction was significantly different. The social support could be a good predictor of addiction.^[38] The result of a study showed that returned people had poor social protection than those who did not return to the drug.^[39] The result was that the psychological trauma was directly related to social support, but this relationship was indirectly diminished. In analyzing the overall effect, there was a significant relationship between the social support and psychological health. Hence, the more support the better the health.^[11-13]

CONCLUSION

Considering the direct predictive power of variables, the results of the present study could be used in the therapy of drug addiction and patient education in relation to addicted patients.

Conflicts of interest

There are no conflicts of interest.

Authors' contribution

All authors contributed to this research.

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