

Abstract

Objective: The present study aimed at investigating the relationship of emotional regulation and negative affect with craving for drug use with the mediating role of depression. **Method:** This study was a correlational and structural research. The statistical population of this study included all the addicts hospitalized in addiction treatment centers in West Azerbaijan Province who had been admitted to the centers during the second six months of 2012 (N = 526). The number of 216 participants was selected using convenience sampling method from the population and responded to the questionnaires of Behavioural Brain System, Negative Affectivity of PANAS, Emotional Regulation Difficulties, Beck Depression Scale, and Drug Craving Scale. **Results:** The results of structural correlation analysis showed that the standard coefficients of the paths of emotional regulation difficulties to craving ($\beta = 0.62$); emotional regulation difficulties to depression ($\beta = 0.35$); the path of negative affects to craving ($\beta = 0.59$); the path of negative affects to depression ($\beta = 0.41$); and the path of depression to craving ($\beta = 0.43$) were statistically significant. In addition, the lower and upper limits of indirect pathways did not entail emotional regulation difficulties and negative affects to craving through zero depression, which indicates the significance of these indirect paths. **Conclusion:** One of the main problems of the society is addiction and this problem has mostly involved the active people of the society; on the other hand, depression and emotional control play an important role in this problem. Hence; it is suggested that families and governmental agencies act more effectively in the prevention of behavioral disorders and that counseling centers be used for the treatment and training of life skills.

Keywords: behavioral-brain systems, negative affect, depression, emotional regulation difficulties, craving

On the Relationship of Emotional Regulation and Negative Affect with Craving for Drug Use with the Mediating Role of Depression

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Introduction

Addiction, drug abuse and psychedelics as one of the most dangerous behaviors have attracted more than 240 million illicit drug users in the global community and at least one million and 325 thousand drug addicts in Iran (Saremi, Ghorbani, Minooi, 2013).) In 2009, in the United States, 2.6 million people over the age of 12 referred to specialist clinics substance abuse for treatment (Cohen, Ilumka, and Salehi, 2015). The World Health Organization (WHO) reported that addiction in 2000 was the cause of mortality rate of nearly two hundred thousand people (Saniotis, 2010). Addiction imposes considerable costs on societies, for example, between 1988 and 1995, Americans spent \$ 57 billion on drugs (Saah, 2005), and according to the World Health Organization (2007), around 200 million people (almost 5%), between the ages of 15 and 64 years old use one or more illicit substances each year, of which about 25 million are classified as drug abusers (Mollazadeh and Ashoori, 2009). In Iran, at least one million and 325,000 people are drugs-dependent users (Saremi et al., 2013). Therefore, today, addiction is one of the most important concerns of societies, and epidemiology studies have reported significant figures among populations (Yagwobi, Tareman, Peirovi and Zafar, 2012; Hall, Irwin, Bowman, Frakenderger & Jewtt, 2005).

Craving for drug use is a central element in addiction and drugs abuse and its continuance and after the onset of treatment, it leads to returning to addiction (Basharpour, Khosroonia, Atadokht, Daneshvar, Narimani, Mash, 2014). Drug craving is defined as the tendency for substance use, by which existence as the component of conscious subjective experience or individual experience is the main element of this phenomenon.

Craving for drug use is a personal experience and a multidimensional phenomenon that is combined with desire to create a pleasant feeling and overcome an unpleasant feeling (Rosenberg, 2009). The findings of physiologic psychologists show that there are two underlying neurobiological factors for addiction. A) Limbic circuit, which is the circuit of reward and is associated with emotion and motivation. B) The prefrontal circuit that inhibits the search for drugs, thinking about drugs, etc., and prevents individual behaviors in the event of a positive and negative necessity that regulates one's emotions.

One of the effective probable variables on drug craving is the problem of emotional regulation. Since, the regular drug users report that drug use has a positive effect on the relief of their negative emotional states, substance use may act as an emotional regulation strategy to reduce the annoying emotional states (Bonn, Vujanovic & Zvolensky, 2008). The emotional regulation is a process by which individuals adjust their emotions to achieve a desirable outcome (Aldao, Nolen & Schweizer, 2010). In recent years, emotional regulation difficulties have been introduced as one of the effective and determining factors in the tendency of individuals, especially the youth and adolescents to high-risk

behaviors (Mickey Manie, 2013). The studies of emotional regulation have led to the emergence of a conceptual model for emotional regulation difficulties, based on which this issue has four distinct, but related aspects: 1) Lack of knowledge, understanding and acceptance of emotional experience; 2) Lack of access to adaptive tools of change or emotional experience duration; 3) Unwillingness to experience emotional pressure as a part of the process of achieving the goal; 4) Maintenance and insistence on targeted behaviors during depression. The most important feature of the above model is its focus on one's emotional response (not the quality of emotions) (Gartz, 2004; quoted from Mickaili, 2013). Subjects at high risk of drug abuse show less stable and regulated emotional behaviors than those who are at low risk (Shedler, J., & Block, J., 1990). In a meta-analysis of 114 studies on psychiatric pathology and emotion regulation strategies, it was revealed that emotion suppression was associated with the drug use disorders (Aldeau, Nullen, and Susser, 2010). In a research, the researchers found that the individuals vulnerable to addiction had a higher risk of impulsiveness, risk taking and emotion seeking compared with the control group. Also, the results showed that addicted people had a significant difference in emotion seeking variable with control group (Eskandari and Helmi, 2014). Accordingly, weak emotional regulation is an important precondition for substance use disorder (Mezzich, Tarter, Feske, Kirisci McNamee & Day, 2007).

On the other hand, another important factor in the tendency towards addiction and drug craving is affect. Affect (feelings, emotions) can influence the process of decision making and thinking at least in certain circumstances and events. Often, negative emotions such as anger, grief and sorrow affect the process of thinking and decision making (Ghasemzadeh, 2015). The above emotions can be generally called as negative emotions, and opposite to it, the positive affect is a state of active energy, high concentration enjoyable work. Positive and negative affect represents the main dimensions of emotional states (Watson, Clark, & Tellegen, 1988; Watson & Tellegen, 1985). In a research, it was found that was a negative relationship between positive affect and return to addiction (Ghasemzadeh, 2015). In another study, it was found that negative emotions are the mechanisms that cause dependence and increased use of drugs and relapse (Garland, Boettiger & Howard, 2011). Therefore, most researchers believe that negative emotions can cause the craving and relapse of use in quitters (Banna, Back, Do & See, 2010). Also, Shen, Liu, Li, Zhang, & Zhou (2012) showed that negative affect is highly correlated with the craving for drug use. The perspective of emotion regulation offers therapeutic components by which the clients can be more comfortable in experiencing emotional excitement and are able to access and understand emotional information in solving adaptive issues, and can also be able to adjust emotional experiences and express them based on the situational demands (Stasiewicz et al., 2013).

The mediating variable in this study is depression. Many patients who seek treatment for drug dependence or are referred for treatment for drug dependence have a double diagnosis (Zemestani Yamchi, and Borjali, 2011). It means that, in addition to the diagnosis of drug dependence, other syndromes such as depression or personality disorders are also detected (Beck et al., Goodarzi translated, 2001). Therefore, depression is one of the most important outcomes of drug dependence. In a research that was conducted to determine the factors influencing drug use tendency, the findings showed that depression and mood changes are one of the effective factors on drug use (Quoted from, Narimani, 2002). Also, in another study with the same title, which was carried out on 90 prisoners in Ardebil, it was found that depression among predictive variables of substance use has the greatest impact on the tendency of youth to addiction, and after that parents' divorce, socializing with malicious people and smoking are the most important predictors of drug use tendency (Molavi and Rasulzadeh, 2004). Depression can change the cognitive systems of individuals irrationally and direct their thinking to negative or selective bias (Fati and Farid Hosseini, 2011). Therefore, people with depression may not have good emotional regulation due to their cognitive system dysfunction and are constantly negatively affected by negative thinking due to their selective thinking, tunnel vision and other logical errors, and depression seems to have a mediating role in emotions regulation and craving for drug use.

Drug addiction is one of the most common social harms in the contemporary world, including Iran, so that, there will be no exaggeration, if it is claimed that drug addiction is one of the major crises of the present world and has become a global dilemma. This shows the need for scientific attention to these social harms. Therefore, according to the above items regarding the relationship between the craving for drug use and the emotional regulation difficulties and negative affect on the one hand, and the relationship between depression (as a mediating variable), with emotional regulation difficulties, negative emotions and craving for drug use on the other hand and finally, the research shortcoming of the present subject seeks to answer the question of whether the structural relationship model is fit between emotional adjustment and negative emotions with craving for drug use with the mediating role of depression?

Method

Population, sample and sampling method

This study was a correlational and structural research. The statistical population of this study included all the addicts hospitalized in addiction treatment centers in West Azerbaijan Province who had been admitted to the centers during the second six months of 2015 (N = 526). The statistical sample of this study was 216 addicts with craving for drug use as selected from the statistical population using convenient sampling method (n = 216). The average age of the participants in this study was 33.78 and the standard deviation was 8.71. Also, 94.90% of the

participants were male. Among the inclusion criteria were at least the history of using at least one narcotic substance, consent for cooperation, and having a minimum age of 16 and a maximum of 62 years, and the exclusion criteria were dissatisfaction with the cooperation and being clean of drug use.

Instrument

1. **Drug Craving Scale:** This questionnaire was developed by Salehi Fadradi, Barrafan and Amin Yazdi (2010) consisting of 20 items. This scale is used to measure the amount of thoughts and dreams related to the substance and the temptation to use. The scoring of questionnaire is based on a 6-point Likert scale (quite right = 5 and not at all true = 0). To assess validity, the situational confidence questionnaire of Anis and Graham (1988) ($r = 0/53$), Psychological desire (2004) ($r = 0.48$) and positive emotions ($r = -0.32$) and negative emotions ($r = 0.55$) by Watson, Clark, and Telgan (1988) were applied and the size of correlations verified validity. The reliability (Cronbach's alpha) in the present study was 0.78.

2. **Emotional Difficulties Scale:** This scale consists of 36 items and 6 subscales. The sub-scales include: Non-acceptance of emotional responses, 2. Difficulties engaging in goal directed behavior (GOALS) Impulse control difficulties, Lack of emotional awareness, Limited access to emotion regulation strategies and lack of emotional clarity. The method of scoring is to ask the participants to specify how much each term is applied about them. Responses range from one to five. The total internal consistency is 0.93 and for each sub-scale it is 0.85, 0.89, 0.86, 0.80, 0.88 and 0.84, respectively. The higher the score, the lower the emotional regulation. The reliability of Cronbach's alpha in this study was 0.69.

3. **Beck Depression Scale:** The Beck Depression Scale has two long and short forms. The long form used in this study has 21 items whose responses are evaluated on a four-point scale. Investigations usually have a high degree of correlation between scores of this scale and other scales of depression. For scoring, the person is asked to answer the questions according to his or her own situation. Then, the score of the person who is graded from 0-3 is graded, added and the total depression score is obtained. The reliability of the questionnaire has shown that the coefficient of internal consistency is 0.73 to 0.65 and the re-test reliability is from 0.48 to 0.90 at intervals of several hours to four months. The validity of this scale in terms of Cronbach's alpha in the present study was 0.81.

4. **Positive and Negative Affect Scale (PANAS):** It is a 20-item instrument designed to measure two mood dimensions, namely negative and positive affect (Watson et al., 1988). Each sub-scale has 10 items. For scoring, a 5-point Likert scale (1 = very low to 5 = very high) is used. This scale is desirable in terms of psychometric properties (validity and reliability) (Watson et al., 1988). The reliability by internal consistency method for negative Pansas is 0.87 and for positive Pansas is 0.88. The test retest reliability with an interval of 8 weeks for

negative Pansas is reported to be 0.71 and for positive Pansas as 0.68. The validity of this instrument is satisfied by calculating the correlation between negative Pansas and positive Pansas with some research instruments that measure the structures associated with these two scales, such as anxiety. In one study, in the Iranian population, the validity coefficients of- 0.77 and 0.83 were shown for positive and negative PANAS, respectively (Kaviani, Soleimani, Sajadi and Nazari, 2003). The reliability of this questionnaire was 0.75 in Cronbach's alpha.

Procedure

In this research, the Narcotics Council of West Azarbaijan was selected to identify the research sample and the required data collection then, after coordination with the relevant authorities, the statistics of the camps of the province were obtained and then various camps have been referred. One of the rooms of the camp was designated as the workplace of the researchers, then, a meeting was held with the camp authority and the required data about the condition of addicts were collected. Then the selected addicts were questioned. Collected data were analyzed using SPSS and AMOS software, and were analyzed based on descriptive tests, Pearson correlation coefficient and structural equations modeling.

Findings

The mean and standard deviation of the age of the participants in the research was 33.88 (66.6) years; 94.4% of the participants were men and (1.5%) were women. In terms of education, the majority were guidance school (36.1%) and the least of them were illiterate (3.7%). Most of them were heroin users (31.9%) and a few of them were cannabis users (1.4%). Of total addicts, 41% referred for the first quitting and the rest of them had quitted twice.

Table 1: Descriptive statistics of the studied variables

<i>Variables</i>	<i>N</i>	<i>Min</i>	<i>Max</i>	<i>Mean</i>	<i>SD</i>
Behavioral inhibition	216	9/00	26/00	18/01	5/24
Behavioral activation	216	23/00	42/00	30/72	4/82
Depression	216	13/00	52/00	31/51	10/40
Emotional regulation difficulties	216	65/00	136/00	99/70	21/08
Negative affect	216	13/00	41/00	28/31	8/27
Craving for drug use	216	22/00	87/00	57/40	23/25

The correlation matrix of the studied variables is presented in Table 2.

Table 2: Correlation Matrix of Behavioral Brain Systems with Craving for Drugs

<i>Variables</i>	<i>1</i>	<i>2</i>	<i>3</i>	<i>4</i>	<i>5</i>
Craving for drugs	1				
Behavioral inhibition	0/869**	1			
Behavioral activation	-0/776**	-0/754**	1		
Depression	0/889**	0/824**	-0/678**	1	
Emotional regulation difficulties	0/704**	0/724**	-0/750**	0/823**	1
Negative affect	0/706**	0/826**	-0/730**	0/836**	0/867*

As shown in Table 2, the results of Pearson correlation coefficient showed that there is a positive relationship between craving for drug use and behavioral inhibition system ($r = 0.869$); depression ($r = 0.889$); emotional regulation difficulties ($r = 0.704$) and negative affect ($r = 0.706$); there is a negative relationship between craving for drug use and behavioral activation system ($r = -0.776$).

The comparison of the fit indices of the proposed model and the modified model is presented in Table 3. According to the results of Table 3, although in the proposed model, the three relative chi-square (CMIN / DF), Adjusted Goodness of Fit Index (AGFI) and Parsimonious Normalized Fit Index (PNFI) verified the fit of model, other indicators such as Goodness of Fit Index (GFI), Incremental Fit Index (IFI), Tauker Lwis Fit Index (TLI), Comparative Fit Index (CFI), and Root Mean Square Error of Approximation (RMSEA) have verified the lack of fit of the proposed model. Therefore, we need to modify the model. To improve the model, two modifications of correlation of the paths of variables and error paths that were highly correlated with the main variables of these errors were selected and correlated with suggested options of AMOS software. After applying the modifications and changes, the model was re-tested and, as shown in Table 3, all the fit indices of the modification model, verified the fit of the model.

Table 3: Comparison of Proposed and Modified Model Fit Indices

[illegible]

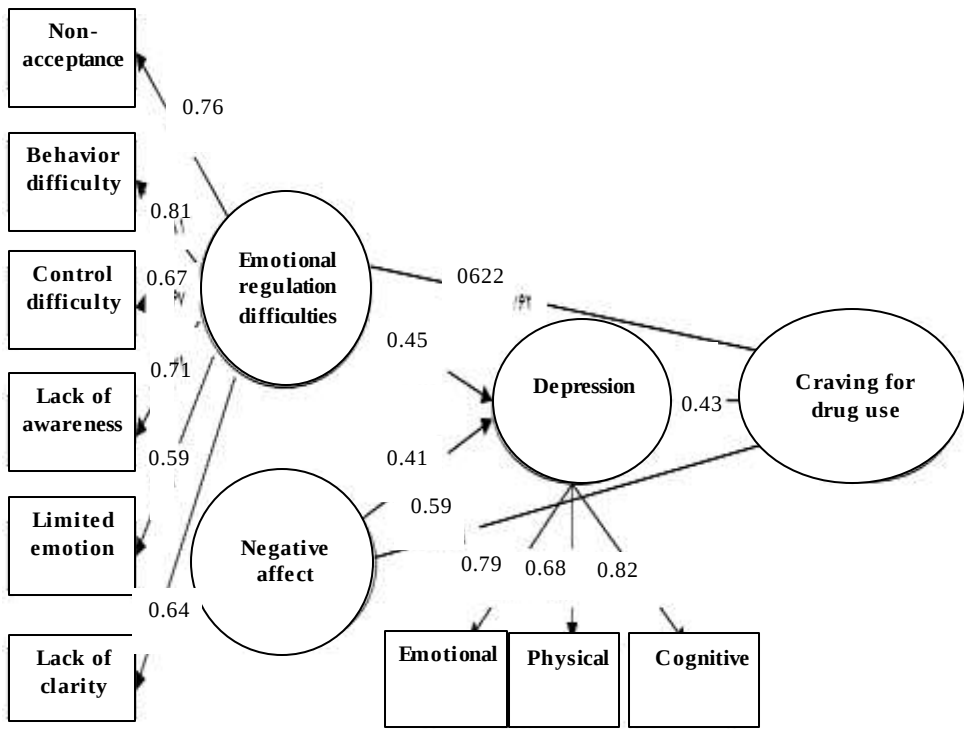


Figure 1: Final modified model with standard paths coefficients

The standard coefficients of the paths in Figure 1 indicate that the paths of emotional regulation difficulties to craving ($\beta = 0.62$); emotional regulation difficulties to depression ($\beta = 0.35$); the path of negative affects to craving ($\beta = 0.59$); the path of negative affects to depression ($\beta = 0.41$); and the path of depression to craving ($\beta = 0.43$) were statistically significant at the level $P < 0.01$. The AMOS software bootstrap test was used to evaluate the significance of the intermediate relationship and the results are shown in Table 4.

Table 4: Bootstrap Test Results for Indirect Paths

Predictive variables	Mediating variable	Criterion variable	Re-sampling	Lower limit	Upper limit	Confidence interval
Emotion regulation difficulties	Depression	Craving for drug use	216	-0/004	0/138	0/95
Negative affect	Depression	Craving for drug use	216	-0/006	0/193	0/95

The results presented in Table 4 show that the lower and upper limits of indirect pathways did not entail emotional regulation difficulties and negative affects to craving through zero depression, which indicates the significance of these indirect paths.

Discussion and Conclusion

The subject of this study was to investigate the relationship between emotional regulation difficulties and negative affect with craving for drug use with the mediation of depression. The results of the research showed that there is a positive relationship between craving for drug use and behavioral inhibition system ($r = 0.869$); depression ($r = 0.889$); emotional regulation difficulties ($r = 0.704$) and negative affect ($r = 0.706$); there is a negative relationship between craving for drug use and behavioral activation system ($r = -0.776$). Also, The results of structural correlation analysis showed that the standard coefficients of the paths of emotional regulation difficulties to craving ($\beta = 0.62$); emotional regulation difficulties to depression ($\beta = 0.35$); the path of negative affects to craving ($\beta = 0.59$); the path of negative affects to depression ($\beta = 0.41$); and the path of depression to craving ($\beta = 0.43$) were statistically significant at the level $P < 0.01$. In addition, the lower and upper limits of indirect pathways did not entail emotional regulation difficulties and negative affects to craving through zero depression, which indicates the significance of these indirect paths.

The results of this study are consistent with the findings of Bonn Miller, Vujanovic, & Zvolensky (2009), Rosenberg (2009), Shen, et al. (2012), Stasiewicz et al. (2013), Shedler, & Block (1990), Aldao et al. (2010)), Eskandari and Helmi (2014), Mazi (2007), Bana (2010), Ghasemzadeh (1394), Beck et al., Goodarzi (2001), Narimani (2002), Molavi and Rasolzadeh (2004). So, Shen and et al (2012) showed that negative affect has high correlation with the craving for drug use. In another study, a meta-analysis of 114 studies revealed that psychiatric pathology and emotion regulation strategies were associated with the drug use disorders (Aldao, Nolen & Schweizer, 2010). Also, Eskandari and Helmi reported that the individuals vulnerable to addiction had a higher level of impulsiveness, risk taking and emotion seeking. Also, the results showed that addicted people had a significant difference in emotional seeking with control group (Eskandari and Helmi, 2014).

One of the factors that lead to individual's tendency to use drugs is to escape from problems, disability in problem solving and behavioral disorder. One of the disorders associated with drug use is depression. Depending on the fact that people who are susceptible to drug use have difficulties in emotion control; on the other hand, negative affect also plays a role in craving for drug use. Depression can act as a mediating variable. In this study, we aimed to investigate the structural relationships between the emotional regulation difficulties and negative affect with craving for drug use. In this regard, the role of depression as a mediator of these variables was investigated. As the results showed, in the proposed model depression acts as a mediating variable between emotion regulation difficulties and negative affect with craving for drug use. In all of these studies, emotional factors (as mediating variables in this study) have a direct relationship with craving for drug use and predict it. According to Lazarus, a person faces two major sources of stress in dealing with a major event or severe

stress, first is a stressful situation that may threaten his or her life and health and reduces individual care, and second is an individual's reaction to this situation may be as threatening as possible. Severe anxiety, confusion, and frustration can reduce the control of a person's behavior and reduce his ability to solve problem (Thoits, 1986) and prepare him for addiction and using more drugs. Another study has shown that stress and stressful experiences in life are associated with the first use of alcohol, alcohol-related problems, smoking and ultimately drug dependence (Courtois et al., 2007; quoted by Nouri, Kelishadi and Ziauddin, 2010). In fact, it can be concluded that a high-pressure environment may be involved in excessive use of alcohol and drugs, drug dependence, craving and relapse. As one of the main problems of the society is addiction and this has involved mostly the active people of the society (the average age in the present research is 33.88 years) and depression and emotional control are effective on this problem, it is suggested that families and government systems be more active in the prevention of behavioral disorders and can use counseling centers for the life skills treatment.

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