

## Abstract

**Objective:** This study aimed to evaluate the effectiveness of mindfulness-based cognitive therapy in craving, dependency, and cognitive emotion regulation among drug-dependent women. **Method:** A quasi-experimental research design along with pre-/post-test and a control group was employed for the conduct of this study. The research population consisted of all drug-dependent women admitted to addiction treatment centers in the city of Tabriz in the first half of 2015. The number of 30 participants (15 patients in the experimental group and 15 patients in the control group) was selected via convenience sampling method. Brief Substance Craving Scale, Dependency Severity Index, and Emotion Regulation Questionnaire were used for data collection. Mindfulness-based cognitive therapy was administered in 10 sessions. **Results:** The results showed that mindfulness-based cognitive therapy led to the significant reduction of drug use craving and drug dependence severity and significantly increased the use of positive cognitive emotion regulation strategies in drug-dependent women. **Conclusion:** Mindfulness-based cognitive therapy is effective in craving, dependency, and cognitive emotion regulation among drug-dependent women.

**Keywords:** mindfulness-based cognitive therapy, craving, dependency, cognitive emotion regulation, drug-dependent women

## Effectiveness of Mindfulness-Based Cognitive Therapy in Craving, Dependency, and Cognitive Emotion Regulation in Drug-Dependent Women

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## Introduction

Drug dependence is a serious clinical concern, with significant economic, social and personal costs that result in high levels of self-destructive and harmful behaviors for health (Gratz, & Tull, 2010). The perception of most people about addiction is that drugs and drug dependence are mostly a masculine phenomenon. While women go on to become addicted along with men, (Dehghani Firoozabadi, Ghasemi, Safari, Ebrahimi and Etemadi, 2013). In recent years, the prevalence of drug use among both genders of society has increased and according to research reports, its rate of increase was significantly higher in women than in men (Vafamand, Kargarfard, Salehi and Ghasemi, 2013). Addicted women are more likely to have psychological problems than addicted men. Low self-esteem, low self-efficacy, lack of matching power in a person to deal with daily life events can be an PRELUDE to addiction or the results of addiction (Shayegan, 2011). Considering women's addiction is essential in that women have multiple effects on different areas of life, and in particular in the family, and as a result, their addiction will have harmful effects on human societies, in particular, the family and the upbringing of children (Farkhajoste, Abdollahi and Ghasmzadeh, 2014).

One of the important things that has an effective role in the tendency to drug use is the craving (temptation) of use. Research on the relationship between the concept of craving and addiction has a long history (Orki, Makarie Vakayi, 2012). In substance dependent individuals, the main focus of the problem is the patient's severe and inevitable craving for continued drugs use; the factor that is the root cause of relapse and medical failure (Dehghani and Rostami, 2010). The term "desire" or "temptation" is important in explaining many addictive behaviors. This term is used to explain the high levels of consumption in relapse. Drug use temptation has an important role in relapse after treatment and maintaining the position of use and substance dependency (Reese & Veilleux, 2015). Craving is a severe and resistant desire to drug use. If this desire is not fulfilled, psychological and physical suffering including asthenia, lack of appetite, anxiety, restlessness, aggression, and depression occur (Makri, Ekhtiari, Edalati, Ganjgahi and Naderi, 2008). In the process of treatment for addicts, after reaching avoidance state, there is a strong desire to experience the effects of the psychedelics substance again. Therefore, the diagnosis and treatment of this clinical phenomenon as one of the factors of failure of treatment is important. Many cocaine-related studies suggest a link between temptation and return to use, temptation, and therapeutic outcomes in cigarette smokers, temptations, and biases in attention to drug-induced stimuli (Monjaman Aghayusefi, 2015).

Tolerance and dependence are the main problems of drug use. Dependence on substance is characterized by repeated drug use and reversible relapse. Probably the most debilitating consequence of repeated drug use is psychological or addictive dependence (Feil et al., 2010). Many drug addicts die

every year via direct and indirect consequences of drug use (Martin, Weinberg, & Bealer, 2007). Dependence can be evaluated by withdrawal syndrome. This phenomenon is due to increased irritability in the various regions of the central nervous system (Simonata, 1996). Continuous drug use by inducing compromising mechanisms creates short-term and lasting changes in the neuronal function and neural networks susceptible to psychedelics. Creating tolerance, dependence, and sensitivity are examples of compromise mechanisms (Williams, Christie & Manzoni, 2001).

Drugs dependence has two physical and mental dimensions, which is characterized by withdrawal syndrome after a fast discontinuation of drugs, with symptoms such as muscle aches, nervous irritability, anxiety and diarrhea which makes the withdrawal process difficult (Gerrits, Lesscher, & Van, 2003).

As regular users report that drugs use has a positive effect on the relief of negative emotional states, substance use can act as a cognitive emotional regulation strategy to reduce the annoying emotional state (Bonn-Miller, Vujanovic, & Zvolensky, 2008). The cognitive emotional regulation is considered as a purposeful process by which people adjust their emotions to respond to the conscious and unconscious environmental expectations (Aldao, Nolen-Hoeksema, & Schweizer, 2010). Cognitive emotion is a goal-oriented process designed to influence the intensity, duration and type of experienced excitement (Gross, & Thompson, 2007). There are various physiological disorders and symptoms that are associated with emotional stress, some of which include pain, smoking, eating disorders, and addiction (Macklem, 2007). Also, some of studies have shown that the difficulty in cognitive emotional regulation is associated with a wide range of disorders, including substance abuse (Gratz and Rumer, 2004). Cocaine-dependent individuals show significant defects in emotional regulation, which is associated with a greater stress response and reduced impulse control (Fox, Bergquist, Casey, Hong, & Sinha

, 2011). Also, the results of Sharibar, Grant and Oudhall (2012) study have shown that individuals with emotional disorder have higher scores in impulsivity, avoidance of harm and cognitive reasoning. Berking et al. (2011) showed that poor cognitive emotional regulation skills predict a high level of alcohol use in the post-treatment period. In a meta-analysis of 114 studies conducted regarding psychopathology and cognitive-emotional regulation strategies, rumination and emotional suppression were associated with substance use disorders, while re-evaluation strategy and acceptance had no association with drugs use (Aldao, Nolen-Hoeksema, & Schweizer, 2010). The individuals who have learnt poor emotional regulation strategies may be more prone to using risky behaviors as a means of relieving negative emotion more than others (Auerbach, Abela, & Ho, 2007).

Today, drug dependence is a global problem. In Iran, over the past 20 years, drug dependence has increased three times more than the population growth rate. The very serious complication of addiction on one's health, family life,

economics, security, and cultural growth of society are very extensive. Thus, treatment of addiction has always been considered as one of the concerns of health policymakers, and considerable amount of the credit of health sector is dedicated to this sector (Basharpour, Atadokht, Khosrowinia and Narimani, 2014). So far, several therapeutic approaches of psychoanalysis, behavioral therapy, group therapy, drug therapy and so on have been done on patients with addiction disorders, and each of these methods has been rather effective and has led to non-relapse of drug abuse. Hence, from among cognitive-psychological approaches being assessed in drugs dependence treatment, behavioral cognitive treatments have achieved high empirical support. Mindfulness-based cognitive therapy (MBCT) is a kind of psycho-educational intervention that helps people practice mental-physical meditation. Mindfulness means paying attention with a specific, purposeful, present and unbiased manner (Walsh, 2009). In this model, in fact, mindfulness means concentrating the deliberate attention of the person towards the experience that is currently used. This attention has unbiased feature and is associated with acceptance (Rosenzweig et al., 2010). Mindfulness, due to its hidden mechanisms, such as: admission, increased awareness, desensitization, presence in the moment, observation without judgment, confrontation and release, can reduce the symptoms and consequences after withdrawal, increase the effectiveness of treatment and prevent relapse of drugs use (Spinella, Martino, & Ferri, 2013). Shonin (2014) and Spinella et al. (2013) in their investigations regarding the role of mindfulness in addiction showed that there was a negative relationship between mindfulness and addiction behaviors in their studies. Witkiewitz, Bowen, Douglas, & Hsu(2013) in a research on the prevention of mindfulness-based relapse on craving have explained that the hidden factors in admission and awareness scores have mediating role significantly in the relationship between the reception of mindfulness and the levels of self-report of craving after treatment, and the individuals experience an unbiased attitude in this therapeutic approach. Research by Whitcoats, Lustyk, & Bowen (2012), Bowne and Vieten (2012) have confirmed the effectiveness of preventing mindfulness-based relapse. Goldin, & Gross (2010) investigated the effect of the program of reducing mindfulness-based stress on emotional regulation in social anxiety disorder. The results showed that mindfulness-based therapy program improved the symptoms of stress, anxiety and self-esteem. Ghamarikivi, Nader, Savari, Esmaeili (2015) found that cognitive-behavioral therapy and mindfulness method are effective in reducing depression and anxiety among crack users. Hamed, Shahidi, Khademi (2014) concluded in their research that educating mindfulness and behavioral counseling to reduce the harms of AIDS and drug use have good practical capabilities for clinical interventions to prevent the drugs abuse relapse. Farnam, Borjali, Sohrabi, Falsafinejad (2014) concluded that teaching a mindfulness-based relapse prevention model was effective in preventing the relapse prevention and increase coping skills.

Mardpour, Najafi, Amiri (2014) concluded that preventing mindfulness-based relapse prevention has a good practical capability for clinical interventions to reduce craving and relapse rate, as well as increase self-control in addicts. Malyani, Alhiari, Azadehfalah, Fathi-asthtiani (2014) concluded that cognition-based mindfulness therapy is more effective in reducing the level of cognitive responsiveness and self-satisfaction enhancing from cognitive-behavioral therapy. Totally, cognition-based mindfulness therapy is more effective than behavioral cognitive therapy for reducing cognitive responsiveness and self-satisfaction. In most countries, there are no or a few treatment programs for addiction and harm reduction in accordance to the needs of addicted women. Also, the mindfulness treatment due to creating comfort, pleasurable feeling, feeling well and activating the parasympathetic device can help the women addiction treatment and studies have shown the effectiveness of muscle relaxation in controlling the side effects of the withdrawal. Therefore, the purpose of this study was to determine the effectiveness of mindedness-based cognitive therapy in decreasing craving, dependence severity and emotional regulation of drugs-dependent women.

## **Method**

### **Statistical population, statistical sample and sampling method**

This research was applied in terms of purpose and was designed by a pretest and posttest test with a control group. The research population consisted of all drug-dependent women admitted to addiction treatment centers in the city of Tabriz (Raha and Reyhane) living in the second half of 2015. After stating the execution of study in two clinics, the study women were registered and then, among 30 women who were registered, 15 patients were assigned in the experimental group and 15 patients in the control group via simple random sampling method. Therefore, the statistical sample of this study included 30 drugs dependent women who were selected by convenience sampling method and were assigned in experimental and control groups using simple random sampling method. Inclusion criteria were: aged 18 to 40, having minimum writing education to fill in questionnaires, more than a week of successful detoxification, non-attendance in other psychiatric sessions, and lack of severe psychiatric disorders. The number of sessions was 8, one and a half hours, which was held as twice in a week.

### **Instrument**

1. Brief Substance Craving Scale: This scale is an 8-item self-report tool built by Somoza, Dyrenforth, Goldsmith, Mezinskis, & Cohen (1995) measuring the length, frequency, and severity of craving on a 5-point Likert scale. It ranges from (0) to very high (4). This test showed a high correlation with the severity of addiction, and its Cronbach's alpha coefficient was reported to be 0.88 (quoted

by Basharpour and Abbasi, 2014). Basharpour (2013) reported the Cronbach's Alpha coefficient of this questionnaire to be 0.78.

2. Dependency Severity Index: It consists of five items and is a useful, quick and easy tool for assessing the psychological aspects of different drugs dependence. This test assesses the severity of drug or alcohol dependence on a four-point Likert scale from never (0) to always (3) for the first four items and not at all difficult (0) to impossible (3) for item 5. The scores for the 5 items are gathered to compute the general score of this index, with a score ranging from 0 to 15, and the score 15 represents the highest level of dependency. Reliability was reported as 0.71 via the internal consistency of the test and the correlation coefficient between the pre-test and post-test was 80% (quoted by Bash arpur and Abbasi, 2014). Basharpour (2013) reported the Cronbach's alpha coefficient of this questionnaire 0.86.

3- Emotion Regulation Questionnaire: This questionnaire is a self-report tool developed by Garnefski, Kraaij, & Spinhoven in 1999 and was published in 2001. The questionnaire consists of 36 items and cognitive strategies for emotions in responding to stressful and life-threatening events are five points (never 1, rarely: 2, some times: 3, most often: 4, always 5), in terms of nine subscales (Questions 29, 30, 31, and 32), acceptance (questions 5, 6, 7 and 8), rumination (questions 3, 9, 10, 11, and 12), positive re-focusing (Questions 13, 14, 16, 17, 18, 19, 20, 21, 22), positive reappraisal (questions 15, 23, 24, 25, 26 and 27), focus on planning (questions 13, 14, 16, 17, 18, 19, 20, 21 and 22), putting into perspective (Questions 15, 23, 24, 25, 26, and 27), self-blame (questions 1, 2, and 4) and other-blame (Questions 34, 35, and 36), and each item has the score between 1 (never) to 5 (always). There is no inverse question in the questionnaire. In the preliminary study of validation features of this questionnaire in general populations (N = 365, 197 women, and 171 men), the Cronbach's alpha coefficients for subscales were reported from 0.67 to 0.89. The designers of this questionnaire reports the reliability of this questionnaire via Cronbach's alpha for positive strategies of 0.91, negative strategies of 0.87 and the total questionnaire 0.93. The psychometric properties of this questionnaire in Iranian sample among 478 people showed satisfactory reliability test re-test and internal consistency (Besharat and Bazzazyan, 2013). The re-test reliability for the interval of two to four weeks for self-blame was 0.70, acceptance 0.81, rumination 0.74, positive re-focusing 0.77, planning 0.83, positive re-appraisal 0.76, putting into perspective 0.78, catastrophizing 0.72, for other -blame as 0.80. Cronbach's alpha coefficients have been reported for cognitive-emotional regulation in the range of 0.78-0.93. Content validity has been reported from 0.77 to 0.87 based on the kendall's coefficient of concordance. With regard to convergent validity and diagnostic validity, the subscales of Persian version of the cognitive emotional regulation questionnaire has been correlated specifically with symptoms of depression, anxiety, stress and mental health indices (Fekri, Isazadegan, and Mikailimonie, 2015). Yousefi (2007) obtained the reliability

coefficient using Cronbach's alpha in Iranian adolescents for negative emotional regulation strategies as 0.78 and the positive emotion regulation strategies were 0.83 and total scale as 0.81 (Quoted from Tabrizchi and Vahidi, 2015).

### Procedure

For data collection, at first, the necessary permissions were obtained from the relevant organizations and after referring to the addiction treatment centers in order to select the members, 30 individuals were enrolled in the group who wanted to participate in mindfulness-based cognitive therapy, and were assigned randomly in two 15 experimental and control groups. After assignment, both groups completed brief substance craving scale, dependency severity index and cognitive emotion regulation questionnaire. Then, the experimental group (15) was trained on mindfulness-based cognitive therapy, but the control group did not receive any training. After performing 10 sessions of therapy, both groups completed the mentioned questionnaires again.

**Table 1: The Content of Mindfulness-Based Cognitive Therapy Sessions**

<i>Sessions</i>	<i>Content</i>
<b>First</b>	The implementation of a pre-test, discussing the importance of non-pharmacological treatment of addiction, determining the time and place of holding and the duration of the sessions, introducing the members with each other and the group leader, introducing group rules and regulations.
<b>Second</b>	Introduce a mindfulness-based cognitive therapy model, introducing functional analysis, providing logic for homework.
<b>Third</b>	The clarification and prioritization of goals, attention to the patient's bias in withdrawal, identifying and confronting drugs-related thoughts.
<b>Fourth</b>	The understanding of the patient's experience of the desire to use, the transfer of the nature of desire as a short and transient natural experience, the identification of symptoms and desire for consumption.
<b>Fifth</b>	Identifying the stimulus of desire, teaching and practicing desire to use control
<b>Sixth</b>	Assessment of the availability of drugs and steps to reduce it, reviewing strategies for disconnecting with drugs suppliers, learning and practicing drugs avoidance, reviewing the difference between passive, aggressive, and courageous responses.
<b>Seventh</b>	Examining homework, discussing members' communication practices, training drugs avoidance skills, practical training in the group.
<b>Eights</b>	Understanding of seemingly irrelevant decisions and their relationship to hazardous situations, identifying examples of seemingly unrelated decisions, practicing sound decision making.
<b>Ninth</b>	Prediction of future hazardous situations, development of a general countermeasures plan.
<b>Tenth</b>	Review of the programs and goals of treatment, give feedbacks about progress, receive feedback from the patient about the successful and unsuccessful aspects of therapy.

### Results

The descriptive statistics of the studied variables are presented in Table 2.

**Table 2: Descriptive Statistics of Studied Variables**

<i>Variables</i>	<i>Groups</i>	<i>Mean of pre-test</i>	<i>SD of pretest</i>	<i>Mean of posttest</i>	<i>SD of posttest</i>
<b>Craving</b>	Experimental	24/13	3/35	16/66	3/77
	Control	21/60	4/27	19/60	6/19
<b>Drug's dependence severity</b>	Experimental	12/40	1/72	8/60	2/26
	Control	9/80	1/65	8/20	2/56
<b>Positive cognitive emotional regulation</b>	Experimental	42/66	13/76	59/13	12/35
	Control	47/60	6/63	52	9/18
<b>Negative cognitive emotional regulation</b>	Experimental	62/46	7/46	46/53	8/99
	Control	59/40	9/13	55/60	12/70

A multivariate covariance analysis is used to examine the effectiveness of therapy, one of the assumptions of this analysis is the equation of error variances. The results of the Leven's test for this assumption are presented in Table 3.

**Table 3: Leven's Test Results for Homogeneity of Error Variances**

<i>Variables</i>	<i>F statistics</i>	<i>Degree of freedom</i>	<i>Significance</i>
<b>Craving</b>	0/167	28	0/68
<b>Dependence severity</b>	2/185	28	0/15
<b>Cognitive emotional regulation</b>	0/557	28	0/46

As shown in Table 3, the homogeneous assumption of error variances in all variables is satisfied ( $P > 0.05$ ). In order to verify the equality of variance-covariance matrix, a box test was used which showed that this assumption was satisfied ( $P > 0.05$ ,  $M_{box}=5.33$ ). Also, the results of Kolmogorov-Smirnov test showed a normal distribution of variables in two groups ( $P > 0.05$ ). Therefore, multivariate covariance analysis was performed and the results showed a significant difference between the linear composition of the variables in the two groups ( $P < 0.001$ ,  $F=13.160$  Wilks'  $\Lambda=0.28$ ). To evaluate the difference model of uni-variate covariance analysis is shown in Table 4.

**Table 4: Univariate Covariance Analysis Results to Examine Difference Patterns**

<i>Variables</i>	<i>Sum of squares</i>	<i>Degree of freedom</i>	<i>Mean of squares</i>	<i>F statistics</i>	<i>Significance</i>
<b>Craving</b>	102/98	1	102/98	4/37	0/047
<b>Drugs dependence severity</b>	14/39	1	14/39	3/31	0/081
<b>Positive cognitive regulation</b>	478	1	478	19/27	0/001
<b>Negative cognitive regulation</b>	795/93	1	795/93	15/45	0/001



As shown in Table 4, there is not a significant difference between the groups in the drugs dependence severity variable ( $P > 0.05$ ). In other words, mindfulness-based cognitive therapy had a significant difference in craving ( $P < 0.05$ ) and positive and negative cognitive regulation ( $P < 0.001$ ).

### **Discussion and conclusion**

The purpose of this study was to determine the effectiveness of mindfulness-based cognitive therapy in decreasing craving, dependence severity and cognitive emotional regulation of drugs-dependent women in Tabriz. The results of this study showed that mindfulness-based cognitive therapy could reduce craving and drugs dependence severity of addicted women in the experimental group compared with the control group. These results are consistent with the results of the researches of Spinella, Martino, & Ferri (2013), Schonin (2014), Spinella, Martino, & Ferri (2013), Witkiewitz, Bowen, Douglas, & Hsu (2013), Whitcoats, Lustyk, & Bowen (2012) Bowne and Vieten (2012), Kiani, Ghasemi and Pourabbas (2012), Hamed, Shahidi, Khademi (2014), Mardopour, Najafi, Amiri (2014), Mellyani, Alhiari, Azad Falah, Fathi Ashtiani (2014). In explaining the above findings, it can be said that mindfulness is a method used by individuals to relieve themselves of increasing suffering and existing pain (Gunaratana, 2002). Therefore, mindfulness is the main component of an integrated system that supports us in identifying the inner suffering of humans and provides us with the conscious use of this treatment (Kabat-Zinn

, 2005). In this therapy, by teaching mindfulness and practice in the present, the effect of the physiological and emotional sensibilities of drug use on apparent behavior is moderated by the relationship of the individual to these experiences. Therefore, in this treatment, users are trained to receive their experiences and to the extent that they can accept and tolerate these experiences, they can act independently of experience (Kayani et al., 2012). Teaching tasks such as functional analysis, coping with the desire to use, the sense of mastery and ability in individuals that is effective in increasing the motivation of treatment or at least the survival of the treatment and avoiding risky behaviors (Brooky, Kamarzrin and Zare, 2014) In this regard, Dabbaghi et al. (2007) showed that mindfulness-based cognitive therapy can be effective in reducing the rate of relapse, increasing obedience therapy and survival in treatment.

Also, the results of this study showed that mindedness-based cognitive therapy increased the use of positive strategies for cognitive-emotional regulation and reduced the use of negative strategies for cognitive emotional regulation in drugs-dependent women. These results are consistent with the findings of Goldin, & Gross (2010), Shapiro, Carlson, Astin & Freedman (2007), Junkin (2007), Ghamarikivi, Nader, Savari, Esmaeili (2015), Teimuri, Ramezani and Mahjub (2015) and Farnam, Borjali, Sohrabi and Falsafinejad (2014). Theoretical interest in the cognitive and emotional components of the mindfulness has made it an effective technique.

Shapiro, Carlson, Astin & Freedman (2006) have proposed the three principles of intention, attention and attitude. Intention refers to the intentional or motivational aspects of mindfulness, the attention is mindfulness and experience observation at present, and the attitude refers to non-bias and acceptance of the experiences. They believe that the mindfulness includes a variety of psychological mechanisms that reduce distress. These mechanisms re-understand experiences from a view and better meta-cognitive perspective, improving emotional self-regulation, increasing mental flexibility, and desensitizing annoying experiences via facing the lack of perceived threat. It is likely that these are emotional and cognitive aspects of a neuropsychology framework, by which, mindfulness is associated with substance abuse (Kalivas & Volkow, 2005). In the relationship between mindfulness and emotional cognitive regulation, the emphasis is on accepting the irrationality of thoughts and emotions that are the core of mindfulness (Kabat-Zinn, 1990). Those who practice mindfulness learn to deliberately observe their emotional states and accept that this makes them to reduce the permanent tendencies (habits) as seen as rumination (Brown, Goodman & Inzlicht, 2013). It also enhances the comparative processing of emotional information (Farb, Anderson & Segal, 2012). It can be said that the teaching of mindfulness in the sense that it increases one's attention and awareness towards physical and psychological feeling and leads to the ordering of psychological and physical emotions; helps to clearly see and accept emotions and physical phenomena, as they happen (Brown, Ryan and Creswell, 2007). One of the important aspects of mindfulness therapy is that this group of people learns to cope up with negative emotions and thoughts, and to experience mental events positively (Bohlmeijer, Prenger, Taal & Cuijpers, 2010). In fact, the first and the most important determinant of change in mindfulness-based cognitive therapy is the fundamental mindfulness. Fundamental mindfulness that is based on the acceptance of unpleasant thoughts and different emotional states dramatically increases one's ability to control the impact of his thoughts and excitements and allows a person to have a range of thoughts and emotions without emotional disturbance in the mind (Teimuri et al., 2015). According to the results of this study, teaching mindfulness -based cognitive therapy can be effective in decreasing craving, decreasing dependence severity and cognitive emotional regulation in drugs-dependent women. As a result, by training these skills, an effective step can be taken to treat individuals with substance dependency. One of the limitations of this study is the lack of generalization of the results to addicted men, lack of control over the type of substance and duration of use, lack of follow-up period, and also the limited sample of addicted women. Other researchers are recommended to study this treatment on both genders, by controlling the type of substance and follow-up period.

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