

## Abstract

**Objective:** This study aimed to determine the effectiveness of cognitive-behavioral coping skills training and mindfulness-based relapse prevention program in the improvement of treatment of motivation among drug-dependent individuals.

**Method:** An experimental research design along with pretest-posttest and control group was used in this study. The drug-dependent individuals who presented to drug addiction centers in Ardabil in the first half of 2015 constituted the statistical population of this study. From among this population, the number of 60 subjects was selected via random cluster sampling method and participated in this study. In the next stage, the sample units were placed into three groups, namely cognitive-behavioral coping skills (n = 20), mindfulness-based relapse prevention (n = 20), and control group (n = 20). Then, Stages of Change Readiness and Treatment Eagerness Scale (SOCRATES) were administered to the three groups as the pre-test. Thereafter, therapeutic interventions were performed on the experimental groups and, eventually, all the three groups responded to this questionnaire as the post-test. **Results:** The results showed that there is a difference between the three groups in the post-test mean scores of taking steps, and recognition. The results of Bonferroni post-hoc test showed that both treatment methods were equally effective in the increase of recognition; however, mindfulness-based relapse prevention program was more effective in improving taking steps. **Conclusion:** The results of this study emphasize the need for using training methods of cognitive-behavioral coping skills and mindfulness-based relapse prevention program as complementary methods to medical treatment in drug-dependent patients under treatment.

**Keywords:** cognitive-behavioral coping skills, mindfulness-based relapse prevention, treatment motivation

# The Effectiveness of Cognitive-Behavioral Coping Skills Training and Mindfulness-Based Relapse Prevention Program in the Improvement of Treatment of Motivation in Drug-Dependent Individuals

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## Introduction

The main features of substance use disorders include a collection of cognitive, behavioral, and physiological symptoms, which show that the person continues drug use despite the significant problems associated with drug use (American Psychiatric Association, 2013). Despite the obvious negative consequences of drug abuse and addiction, it is still operative as an important public health problem in such a way that there is an estimate of 22.6 million consumers of stimulants only in the United States of America (SAMHSA, 2011). According to the report released by the International United Nations Office on Drugs and Crime (UNODC) (2015), the prevalence of drug use is constant over the world. It is estimated that 246 million people –slightly more than 5 percent of 15-to-64-year-old around the world- have used one drug in 2013.

The important features of substance use disorders are the major changes in brain circuits that may continue after detoxification, especially in people suffering from severe disorders. The behavioral effects of these brain changes may be revealed in the frequent relapses and intense craving for drugs when people encounter drug-related stimuli. These continuing effects of drugs may be improved because of the long-term effects of treatment. There are medical treatments for addiction to nicotine, alcohol, and opiates (Potenza, Sofuoglu, Carroll & Rounsaville, 2011). However, there is no proven medical treatment for some other substances, including cocaine (Sofuoglu & Kosten, 2006), methamphetamine (Hill & Sofuoglu, 2007), and cannabis (Sofuoglu, 2010). Since the consequences of medical treatment for addiction are not desirably satisfactory, effective behavioral therapies have also been created (Carroll & Onken, 2005; Dutra, Stathopoulou, Basden, Leyro, Powers & Otto, 2008). From among these therapies, one can refer to the treatments with the strongest level of empirical support, such as contingency management (wherein abstinence or other selected consequences are reinforced through some incentives) (Petry, 2006), motivational interviewing (wherein a specific and nonjudgmental interview style is used to improve motivation and control the person's capacity for change) (Miller, 1985), and cognitive-behavioral therapy (wherein special strategies and skills are taught to reduce drug use) (Carroll et al., 1994; Marlatt & George, 1984), are. Unlike the specificity of the majority of the medical treatments of substance abuse (e.g., methadone or buprenorphine for opioid dependence is effective, but is not that much effective in treatment for cocaine use), behavioral therapies benefit from experimental validation on a wide range of substance use disorders. For example, cognitive therapy, contingency management, and motivational interviewing have been recognized to be effective in alcohol use, cannabis use, and cocaine use disorders (Lussier, Heil, Mongeon, Badger & Higgins, 2006; Dutra et al., 2008).

The training of cognitive-behavioral coping skills is among the most important components of cognitive-behavioral therapy. Cognitive-behavioral coping skills

refer to those skills that are taught to increase the individuals' psychosocial abilities and to enable them to effectively face the demands of life conflicts. The purpose of teaching these skills is to promote psychosocial capabilities, prevent harmful health behaviors, and enhance the mental health of individuals. These capabilities enable the individual to act positively and adaptively in relationship with other human beings, society, culture, and environment, and to promote personal and social development and prevent psychosocial problems (Nikparvar, 2013).

Kober, Kross, Mischel, Hart & Ochsner (2010) carried out a study to regulate craving in smokers by using cognitive strategies and reached the conclusion that concentration on the long-term consequences of smoking significantly reduces craving. Chinaveh (2012) evaluated the effectiveness of coping problem-solving skills training and reported that it leads to improved social adjustment in adolescents. Rus-Calafell (2013) trained the social skills of cognitive-behavioral to a group of outpatients with schizophrenia and indicated that the experimental group experienced significant improvements over symptoms of psychopathology, social distress, social cognition, social isolation, interpersonal relations, and quality of life compared with the control group. Hundt & Mignogna, Underhill & Cully (2013) also concluded that the frequency and quality of using cognitive behavioral skills have a mediating role in treatment outcomes and result in the greater effectiveness of depression treatment. Krattenmacher et al. (2014) evaluated the relationship between coping strategies and mental health in adolescents with parents suffering from cancer and they came to the conclusion that there is a significant positive relationship between the use of problem-focused coping skills and mental health of these children. McGillicuddy, Rychtarik & Papandonatos (2015) compared the effects of coping skills training, twelve-step facilitation therapy, and delayed treatment control on the parents having adolescents with substance abuse and showed that coping skills training creates a higher number of skills compared to the other two methods. Mazaheri, Baghban & Fatehizadeh (2006) also reported that the group training of cognitive behavioral therapy group had a significant impact on students' self-esteem.

Neurobiological findings support the claim that mindfulness meditation can reduce the coercion for consumption and impulsivity (Marlatt, 2002). As Groves & Farmer (1994) asserted, mindfulness in the field of addiction refers to getting aware of the triggering factors in craving for drug use and the choice of doing something else that can improve or prevent drug use craving. According to this conceptualization, the craving responses that are very common in addiction may provide comprehensive awareness and acceptance and disrupt the primary craving responses that are generated without any judgment, analysis or reaction through mindfulness meditation. As per this conceptualization, the research over the past two decades on relapse prevention as a treatment for drug dependency has been integrated with mindfulness-based techniques and, thereby, the

Mindfulness-Based Relapse Prevention program has been created. The purpose of this preventive program is to create awareness, accept the internal and external feelings and thoughts through mindfulness-based practices, and apply the mindfulness skills as an effective coping strategy in the face of high-risk situations. Teaching about drug use craving and the instructions for the application of mindfulness skills is an essential instrument in raising awareness and the acceptance of psychological and physiological reactions of opioid withdrawal.

Bowen et al (2009) found that those who receive mindfulness-based relapse prevention program report lower levels of craving after the treatment. Vitek Weitz, Bowen, Douglas & Hsu (2013) argued that the reduction in craving followed by the treatment of mindfulness-based relapse prevention is a change into the nonjudgmental acceptance, knowledge, and attitudes. Hsu, Collins & Marlatt (2013) also showed that the addicted participants with low distress tolerance who received the mindfulness-based relapse prevention program displayed a significant reduction in adverse consequences related to drug use during the four-month follow-up period in comparison with the participants with low distress tolerance who received the common treatment of substance use. Grow, Collins, Harrop & Marlatt (2015) examined the effect of mindfulness-based relapse prevention and found that the participants who had received this treatment increased the time period spending on the practice of mindfulness after the treatment period; and this increase was associated with the low consumption of alcohol or any other drugs and with the reduced level of drug use craving in 2-month and 4-month follow-ups.

The available evidence suggests that there is a high rate of addiction relapse in drug-dependent individuals and these individuals have a low level of motivation to initiate and maintain treatment. In addition, a high percentage of the addicts who participate in the treatment period return to drug use. This reveals the need for applying aftercare treatment. Given the importance of the validation of therapeutic interventions effective in motivation for addiction treatment, the current research seeks to respond to the following research question: Can cognitive-behavioral coping skills training and mindfulness-based relapse prevention program be effective in the treatment of motivation among drug-dependent individuals?

Method

### **Population, sample, and sampling method**

All the drug-dependent individuals who presented to drug addiction centers in Ardabil in the first half of 2015 constituted the statistical population of this study. From among this population, the number of 60 subjects was selected via random cluster sampling method and participated in this study. The current research method was experimental research design along with pretest-posttest and control

group. For data collection, a list of all outpatient addiction treatment centers in Ardabil, which amounted to 15 centers, was prepared and then one center was randomly selected out of them. Afterwards, the researcher referred to that center (Bamdad Treatment Center) in person and received the records of all clients available in the center. From among these clients, 60 cases were randomly selected and were invited to participate in the study by phone. In the next stage, the sample units were randomly placed into three groups, namely cognitive-behavioral coping skills ( $n = 20$ ), mindfulness-based relapse prevention ( $n = 20$ ), and control group ( $n = 20$ ). Then, Stages of Change Readiness and Treatment Eagerness Scale (SOCRATES) were administered to the three groups as the pre-test. Thereafter, therapeutic interventions were performed on the experimental groups and, eventually, all the three groups responded to this questionnaire as the post-test.

### **Instrument**

Stages of Change Readiness and Treatment Eagerness Scale (SOCRATES): This is an experimental scale that was developed by Miller & Tonigan in 1996 to assess the readiness for change in substance abusers. It consists of 19 items that are scored on a 5-point Likert scale (from strongly disagree (1) to strongly agree (5)) within three subscales, namely recognition, ambivalence, and taking steps. The long versions of this scale were compiled based on Factor Analysis studies and the participants' scores in the three components of recognition ( $r = 0.96$ ), taking steps ( $r = 0.94$ ), and ambivalence ( $r = 0.88$ ) were revealed to have a high correlation with the scores of the 39-item version of this scale. The Cronbach's alpha coefficients of recognition has been reported to be in the range of 0.5 to 0.95, of ambivalence have been reported in the range of 0.60 to 0.88, and of taking steps have been reported in the range of 0.83 to 0.96 (Miller & Tonigan, 1996). Three stages of change had a negative correlation with failure of self-control (in the range of 0.41 to 0.45), but had a positive relationship with their self-compassion (in the range of 0.29 to 0.41) (Basharpour, Atadokht, Khosravinia & Narimani, 2014). The Cronbach's alpha coefficients of the three stages of change in the present study were obtained equal to 0.76, 0.71, and 0.85 for recognition, ambivalence, and taking steps, respectively.

### **Procedure**

Following the random selection of the two experimental groups and one control group, one of the experimental groups received the training program of cognitive-behavioral coping skills. The training has been originally designed by Erguner-Tekinalp & Akkok (2004) in order to enhance cognitive-behavioral coping skills. After its match with the sample group, it was presented in 8 sessions. The implementation of this training program was done during 4 weeks (two 90-minute sessions per week) as follows:

First session: Introduction and establishment of a relationship, pretest administration, presentation of some explanations about the purpose of cognitive-behavioral coping skills training; second session: mindfulness skill training; third session: training of empathy and its application method in everyday life; fourth session: training of effective relationships; fifth session: training of establishing interpersonal relationship skills; sixth session: training of skills to increase self-esteem, seventh session: training of emotional management skills, and eighth session: training of stress management skills, helping people to identify stress, and, finally, posttest administration.

In addition, the second experimental group was put under mindfulness-based relapse prevention program. The mindfulness-based relapse prevention program is an outpatient and group intervention program with its specific instructions that has been constructed by Bowen et al. (2011) for the problematic use of drugs. This method integrates the conventional techniques of cognitive-behavioral relapse prevention with mindfulness meditation. It aims to increase awareness and accept feelings, thoughts, internal and external thoughts through mindfulness meditation practice and use of these skills as a coping strategy in the face of high-risk situations.

According to the structures of mindfulness-based stress reduction (MBRS) and mindfulness-based cognitive therapy (MBCT), the mindfulness-based relapse prevention program was also presented in eight two-hour sessions. The members of these groups discussed the relapse prevention techniques and practiced mindfulness. Group discussions included topics such as automatic pilot willingness, identification of relapse triggers, learning to be aware of the present moment, mindfulness during pleasant and unpleasant thoughts and experiences, promotion of an attitude of acceptance, and work on the practice barriers. The summary of treatment sessions includes as follows: first session: automatic pilot and relapse; second session: awareness of triggering stimuli and craving; third session: mindfulness in everyday life; fourth session: mindfulness in high-risk situations; fifth session: acceptance and skillful practice; sixth session: viewing thoughts as thoughts rather than realities; seventh session: self-care and balance in lifestyle; and eighth meeting: social support and continuous training (Bowen, Chawla & Collins, 2011).

## Results

The number of 60 participants in three 20-person groups participated in this study where the mean value of age (SD) of the cognitive-behavioral coping skills training group was equal to 34.65 ( $\pm 9.25$ ) years, that of mindfulness-based relapse prevention group was equal to 35.90 ( $\pm 9.32$ ) years, and that of the control group was equal to 35.30 ( $\pm 8.84$ ) years. In terms of social-economic status, 7 participants (35%) in the cognitive-behavioral coping skills training group reported their status to be poor, 6 participants (30%) reported it to be moderate,

4 participants (20%) reported it to be good, and 3 participants reported it to be great. In addition, 6 participants (30%) in the mindfulness-based relapse prevention group reported their social-economic status to be poor, 4 participants (20%) reported it to be moderate, 4 participants (20%) reported it to be good, and 5 participants reported it to be great. In the control group, 4 participants (20%) reported their social-economic status to be poor, 8 participants (40%) reported it to be moderate, 3 participants (15%) reported it to be good, and 3 participants (15%) reported it to be great.

The descriptive statistics of factors of treatment motivation are presented in the table below for each group and test.

**Table 1: Descriptive statistics of factors of treatment motivation for each group and test**

<i>Group membership</i>		<i>Cognitive-behavioral coping skills</i>		<i>Mindfulness-based relapse prevention</i>		<i>Control</i>	
		<i>Mean</i>	<i>SD</i>	<i>Mean</i>	<i>SD</i>	<i>Mean</i>	<i>SD</i>
<b>Pretest</b>	Recognition	23.93	6.57	27.10	6.55	29.06	5.47
	Ambivalence	14.55	4.27	15.70	3.97	15.57	3.54
	Taking Steps	27.70	7.74	30.52	8.67	34.06	4.83
<b>Posttest</b>	Recognition	29.21	5.31	29.86	6.47	24.23	7.74
	Ambivalence	17.14	3.63	16.06	4.97	14.15	3.91
	Taking Steps	33.64	8.40	40.06	4.19	23.53	9.78

Multivariate analysis of covariance should be used to investigate the difference in the effectiveness of the therapies. One of the assumptions of using this analysis is the analysis of the equality of covariance matrices. The results of Box's test indicated that this assumption has been met ( $P > 0.05$ ;  $M_{Box} = 39.23$ ). The results of Levene's test indicated that there is no significant difference between the three groups in terms of the error variances in three subscales of recognition, ambivalence, and taking steps ( $P > 0.05$ ). Considering the fulfillment of the assumptions, multivariate analysis of covariance was performed and the results represented the significance of the differences (Eta-squared = 0.37;  $P < 0.001$ ;  $F = 6.22$ ; Wilks's lambda = 0.41). Univariate analysis of covariance was used to examine the patterns of difference as follows.

**Table 2: Results of ANCOVA for comparing the effect of treatment methods on three components of treatment motivation**

<i>Source of variation</i>	<i>Variable</i>	<i>Sum of squares</i>	<i>Df</i>	<i>Mean Square</i>	<i>F</i>	<i>Sig.</i>	<i>Effect size</i>	<i>Statistical power</i>
<b>Pretest</b>	Recognition	39.22	1	39.22	0.86	0.35	-	0.32
	Ambivalence	24.92	1	24.92	1.36	0.25	-	0.22
	Taking Steps	78.38	1	78.38	1.50	0.22	-	0.35
<b>Group membership</b>	Recognition	285.50	2	142.75	3.14	0.05	0.15	0.57
	Ambivalence	59.38	2	29.69	1.63	0.21	-	0.32
	Taking Steps	256.37	2	1128.18	21.64	0.001	0.54	1.00

As it is observed in the above table, there is a significant difference in recognition ( $P < 0.05$ ) and taking steps ( $P < 0.001$ ). Bonferroni post hoc test was used to investigate differences between the groups. The results suggested that there were significant differences between the control and each of the experimental groups in both factors. The significant differences were obtained at the levels of 0.05 and 0.001 for the recognition component and the components of taking steps. Moreover, the comparison of the experimental groups with each other represented the absence of any significant difference between the two experimental groups in terms of the recognition component; however, the mindfulness-based relapse prevention group outperformed the cognitive-behavioral coping skills group in the component of taking steps ( $P < 0.01$ ).

### **Discussion and Conclusion**

Addiction relapse is one of the major obstacles in the treatment of addictive behaviors in such a way that it is considered as the normal consequence of individuals' efforts for behavioral change. Research findings have shown that the twelve-month prevalence of addiction relapse following the discontinuation of alcohol or tobacco use is within the range of 80 to 95 percent (Brandon, Vidrine & Litvin, 2007). The available evidence suggests the similar rate of relapse for other substance use disorders. Therefore, relapse prevention or minimization is a prerequisite for any attempt to the facilitation of successful and long-term changes in addictive behaviors. In this regard, the current study aimed at determining the effectiveness of cognitive-behavioral coping skills training and mindfulness-based relapse prevention program in the improvement of treatment motivation among drug-dependent individuals.

The first hypothesis of this study was that cognitive-behavioral coping skills training and mindfulness-based relapse prevention program have a significant impact on the treatment motivation of drug-dependent individuals. The results of multivariate analysis of covariance showed that there was a significant difference between the posttest mean scores of the three groups in two components of recognition and taking steps after the control of the pretest. The results of Bonferroni post-hoc test also indicated that both treatment methods were equally effective in the increase of recognition. These findings are consistent with those of the studies carried out by Kober et al. (2010); Chinaveh (2012); Hundt & Mignogna (2013); Rus-Calafell (2013); Krattenmacher et al. (2014); McGillicuddy et al. (2015); and Mazaheri et al. (2006) regarding the effectiveness of cognitive behavioral coping skills training. In addition, the findings are in the same line with those of the studies done by Bowen et al. (2009); Hsu et al. (2013); Vitek Weitz et al. (2013); and Groves et al. (2015) on the effectiveness of mindfulness-based relapse prevention program in the negative clinical consequences of drug dependence treatment. Definitions of treatment motivation include some aspects of individuals' readiness for physical

changes into behavior while all these aspects are required to understand motivation at the start and continuity of substance abuse treatment. The transtheoretical model has proposed a broad basis for assessing readiness for change (Prochaska & Velicer, 1997). In this model, behavioral change is described as a dynamic process over time and requires that individuals pass five stages of change: precontemplation, contemplation, preparation, action, and maintenance. Self-efficacy and decision balance are two main constructs of this model. Self-efficacy refers to the person's confidence in avoiding drug use in a certain situation, and decision balance shows the relative weighting to the positive and negative aspects of behavior (Janis & Mann, 1977). In both methods of cognitive behavioral coping skills training and mindfulness-based relapse prevention, the emphasis has been placed upon the acceptance and training of appropriate coping strategies instead of the avoidance of morbid symptoms and behavioral difficulties. These skills can allow the person to think about his/her problems and recognize the presence of those problems in the self, while the avoidance reaction can be a major obstacle to the recognition of the problem. In addition, the main reason for the effectiveness of the two therapeutic methods in the recognition process can be attributed to the effectiveness of these methods in the increase of self-efficacy and decision balance; and these two factors can encourage the person to get involved in the problems and recognize them.

The results of Bonferroni post-hoc test showed that both treatment methods were equally effective in the increase of recognition; however, mindfulness-based relapse prevention program was more effective than cognitive-behavioral coping skills training in improving taking steps. Taking steps corresponds to the transtheoretical model. At this stage, people usually accept their problem but do not act to solve it. Prochaska, Velicer, Ross & Goldstein (1994) suggested that people pass through the five stages of behavioral change using cognitive, affective, and behavioral processes. In cognitive-behavioral coping skills training, the main emphasis is on cognitive and affective processes, such as problem-solving, emotional regulation and their training can help people progress in the process of changes. However, during mindfulness-based relapse prevention, behavioral processes, including practical mindfulness-based exercises are also used in addition to the training of cognitive and emotional skills. By means of these processes, the individual can take action to stop the old behavioral patterns and start the new ones, which is an essential element in the action stage. According to the proposed models in the third wave of cognitive behavioral therapy, changes in the two dimensions of the self, i.e. cognitive self and experiential self are necessary for any kind of change in the behavior. The cognitive self provides the conditions for behavioral changes in the form of change in thoughts and the acquisition of new cognitive behavioral skills, while the experiential self will change with practice. Since cognitive-behavioral coping skills training is more in the form of skills training, it can bring change into the cognitive self. However, mindfulness-based relapse prevention can change one's

experiential self through practical mindfulness exercises and generate a higher level of effectiveness in taking steps towards treatment and its follow-up in addition to the content of cognitive restructuring that leads to changes in psychological knowledge.

The results of this study showed that cognitive-behavioral coping skills training and mindfulness-based relapse prevention have a positive influence on recognition and taking steps. The use of drug-dependent persons referring to outpatient rehab centers, inability to control the type of substance, and the implementation of both of the intervention methods by one single researcher were among the main limitation of this study. The results of this study suggest the necessity of using cognitive-behavioral coping skills training and mindfulness-based relapse prevention as complementary approaches to drug therapy in patients under treatment of drug dependence.

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