

## Abstract

**Objective:** Despite all the efforts made to stop addiction, the high rate of drug use relapse is alarming. The current research aims to investigate the effect of motivational interviewing on reducing craving and relapse in patients under methadone treatment. **Method:** A quasi-experimental research design along with pre-test and post-test was employed for the conduct of this study. From among the number of 60 patients in the methadone treatment center, the number of 30 patients was recognized eligible as the participants of this study. Then, the participants were randomly divided into experimental and control groups. Both groups completed Craving and Relapse Questionnaires (a six-month follow-up) before and after the intervention.

**Results:** The results showed that the research hypotheses on the effectiveness of motivational interviewing in the reduction of craving and relapse were conformed and there was a significant difference between the experimental group, receiving motivational interviewing and pharmacotherapy, and the control group, only receiving pharmacotherapy. **Conclusion:** These findings help experts use psychological therapies along with pharmacotherapy in the field of addiction.

**Keywords:** motivational interviewing, craving, relapse, methadone

# The Effect of Motivational Interviewing on Reducing Craving and Relapse in Substance Abusers under Methadone Treatment

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## Introduction

The dissolution of the individual personality, the destruction of the family institution, the increase of other types of social harms and crimes, the reduction of work efficiency and occupation, the increase of unemployed people in the community, the occupancy of hospital beds, the reduction of public health and other problems all depended on the number of addicts in society (Nastizayi, Hezare Moghaddam and Melazehi, 2010). With all the efforts made for drugs withdrawal, the statistics of relapse is increasing considerably. Friedmann, Saitz, & Samet (1998) have stated that only 20% to 50% of patients remain abstinent during the first year. Brown (1998) states that only 19% of drug users after treatment can keep drug avoidance for six years. Ghasap et al. (1987, 1989, quoted by Hosseini, Ardekani, Vafaei nasab, Kholasezadeh and Dastjerdi, 2010) showed that 81% of quitters had less than six months of relapse. Amini, Amini, Afshar Moghadam and Azar (2002) mentioned the rate of return to drug use 75% (in Iran, 50%). The relapse in the study of (Mutasa, 2001, quoted by Amini et al., 2002) was 80%; among whom 40% had more than three times of drugs withdrawal. Ehsan Manesh and Karimi (1999) examined 377 patients with substance abuse who referred to the outpatient centers of Shiraz; of which 186 were treated and 191 did not quit after the end of treatment.

In addition to relapse, it is assumed that craving plays a major role in the continued use and relapse of addiction. The relapse in drug users is the result of severe craving that occurs when they quit drugs (Anton, 1999; 1955; Pickens, & Johanson, 1992; Robinson, & Berridge, 1993). According to the Diagnostic and Statistical Manual of Mental Disorders (Fifth Edition), craving (a strong mental desire to use drugs) is likely to be experienced by most individuals with drug dependence. Based on many addiction theories in this field, the researchers' conceptualization of craving is incompatible with each other and there is no consensus on the operational definition of craving (Pickens, & Johanson, 1992). Some scholars have restricted the definition of craving to a strong desire, while others, other than desire have defined carving as a range of features, such as anticipating the supplementary effects of medication, considering the involvement in substance use and the tendencies that direct an individual to perform a special act (Tiffany & Drobes, 1991; West, 2006).

Although pharmacotherapy is the first choice for addiction treatment, the use of medication alone, regardless of the extent of the addicts' mental, cultural and economic dependence, only emphasizes the elimination of the active substance of narcotics (morphine), while most experts believe that psychotherapy and long-term group therapy for detoxified patients are much more important than detoxification itself. Unfortunately, the focus on pharmacotherapy causes relapse in 80% of people after less than 6 months (Friedmann, Saitz, & Samet, 1988), while complementary therapies such as psychotherapy, group therapy, occupational therapy, sport therapy, faith therapy and ultimately family therapy

besides pharmacotherapy reduce the chance of relapse from 25% to 2% (Yeganeh, 2006, quoted from Shargh, Shakibi, Nissari, and Alylou, 2011).

Many specialists involved in the treatment of substance dependent patients are interested in knowing how to encourage these patients to quit drugs or remain abstinent. Encouraging behavior change has always been a difficult path. One of these difficulties is when the patient is doubtful about changing or resists against it. Given the need to motivate change in resistant and hesitant patients, the motivational interview was first introduced by Miller in May 1983, specifically to investigate alcohol users. The people Miller worked with were alcoholics who were not ready to change or were hesitant at the time of the interview. This method has had significant research and treatment consideration for more than two decades. Miller, & Rollnick (2012) defined motivational interview as a directive, client-centered counseling style for eliciting behavior change by helping clients to explore and resolve ambivalence.

Prochaska, DiClemente, & Norcross (1992) presented a comprehensive model for the conceptualization of patient motivation for change. They proposed a six-stage model for change: 1. Negligence and ignorance (pre-contemplation), 2. Contemplation, 3. The decision-making stage for change (preparation), 4. Action, 5- Maintenance and 6- Relapse. The most recent definition by Miller, & Rollnick (2012) of motivational interviews is: Motivational interviewing is a counseling directive method (with a client-oriented approach) that helps with through the exploration and resolving ambivalence and the goal of changing behavior. In contrast to counseling without direction, this method is more focused and purposeful. In other words, the main purpose of treatment is to investigate and resolve the doubt and hesitation of the client, and the advisor follows this method with the aim of changing the behavior of the client. Therefore, psychological dependence on the substance decreases through motivational interviewing, and the patient finds enough incentive to quit and not return to consumption (no relapse).

Several studies have shown the use of motivational interviewing in various areas such as smoking, alcohol use, substance abuse, treatment follow-up, eating disorders, diet and exercise (e.g. Arkowitz, Westra, Miller, & Rollnick, 2008; Hettema, Steele, & Miller, 2005). Osterman, & Dyehouse (2012) showed the impact of motivational interview on reduction of prenatal alcohol use disorders.

Satre, Delucchi, Lichtmacher, Sterling, & Weisner (2013) studied the impact of motivational interviewing on reducing substance use in adult outpatients with depression and found that motivational interview reduces drug use in depressed patients. Recent analyses show that motivational interviews have equal value and sometimes more than other treatments such as cognitive-behavioral therapy, pharmacotherapy and non-treatment to reduce alcohol and drug abuse in adults (Lundahl, Kunz, Brownell, Tollefson, & Burke, 2010) and adolescents (Jensen et al., 2011). In addition, motivational interview is effective on health behaviors such as quit smoking (Gray, McCambridge, & Strang, 2005), the reduction of

risky sexual behaviors (Fisher and colleagues, 2006), adherence to treatment and medication and diabetic management (DiLillo, Bursac, Gore, & Greene, 2007) and AIDS care (Parsons, Rosof, Punzalan, & Maria, 2005).

In local researches, the effect of motivational interview have been shown on changes in lifestyle of patients (Navidian, 2009), improving self-esteem and self-efficacy of addicted women (Dehghani Firoozabadi et al., 2012), adherence to treatment (Mirkrimi, Honarvar, Ariayi, Bardi Arzani, Kamran, 2015) relapse reduction in women dependent on drug use (Dehghani Firoozabadi et al., 2012), impulsive reduction in the substance abusers (those without any job) (Zare Mongabadi, 2012), weight loss in obese individuals (Navidian, Abedi, Bagheban, Fatehizadeh, Poursharifi, 2012). But so far, there has been no investigation on the effectiveness of motivational interview on craving and relapse in substance abusers.

Considering the high rates of relapse in substance abusers (Friedman et al., 1998, Brown, 1998, Ehsan Manesh and Karimi, 1999, Amini et al., 2002, Hosseini et al., 2010), the relationship between substance abuse relapse and craving (Atkins and Johnson, 1991, Robinson, & Berridge, 1993, Anton, 1999), the weakness of addiction pharmacotherapy in the issue of relapse, and lack of control of craving (Miller, & Rollnick, 2012) and the role of motivational interview as a psychological change model to compensate for the weakness of pharmacotherapies in reducing craving and returning to drug use, were studied; the purpose of this study was to investigate the effect of motivational interview on reducing craving and relapse in substance abusers under methadone treatment.

## **Method**

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

The methodology of this study was semi-experimental with a pretest-posttest design followed by a control group. The statistical population consisted of addicts (male only) who referred to the Lamerd addiction center in June and July 2014. The average age was 35 and the minimum education was at least elementary and at most associate degree. To conduct the research, the addiction treatment center of Mehr town was selected, and a list of patient patients was obtained after collaboration between management and staffs. To select the sample meeting the inclusion criteria, 80 people received primary interview in which 60 patients met the inclusion criteria, and these were randomly divided into two groups of 30 experimental and control groups. The inclusion criteria in this study were: diagnosis of substance abuse disorder based on the Diagnostic and Statistical Manual of Mental Disorder (fifth ed), diagnosis of this disorder and other accompanying disorders during the first referral of patients to the center to receive medical treatment by the physician or psychologist, getting scores higher than the cut-off scores on the Tiffany's craving Scale (60 points).

## Instrument

1- Substance Use Craving Questionnaire: This questionnaire was developed by Tiffany et al. (1993) to measure the heroin craving in patients dependent on substances; however, due to its overall structure and the ability to measure craving, later, other drugs were used in measuring craving. This questionnaire consists of 45 questions with five factors, which are scored on a seven-point Likert scale of strongly disagree (1) to strongly agree (7). The five main subscales of the questionnaire are anticipation of positive outcome, anticipation of relief, loss of control and intent. The validity of the sub-scales was 0.93, 0.83, 0.81, 0.69, and 0.94, respectively (Tiffany, Fields, Singleton, Haertzen, & Henningfield, 1993). The test retest coefficients were reported to be 0.84, 0.82, 0.77, 0.86, 0.82 for three weeks, respectively (Rad and Rostami, 2009). To assess the validity of this questionnaire, the correlation of scores with Beck Depression Scores 0.39 and Beck Anxiety Scores 0.35 (Heins et al., 2006) was significant.

2- Relapse Prediction Scale (RPS): In this study, to investigate the tendency to use drugs, the relapse prediction scale of Beck and Wright (2001) was used. This scale consists of 47 items with two subscales, which contain situations or states that can cause temptation and, consequently, the desire to substance use in a substance-dependent individual. The scoring on the Likert scale is ranging 0 to 4. To evaluate content validity, the scale was presented to three specialists-PhD in Psychometrics, PhD in psychology and a psychiatrist and their views on this test and its goals were examined; all three specialists indicated the consistency of content and test items with the given goals (Mehrabi, Neshat-Dost and Molavi, 2006). Cronbach's alpha was performed on 40 substance dependent patients during the initial recovery period for temptation amount and desire rate subscales as 0.94 and 0.97, respectively.

## Procedure

The procedure of motivational interview in this group consists of 8 sessions of group intervention, being extracted from the Group Therapy for Substance Abusers book (Treatment instruction based on change stages) by Wlaskowice, Maryn,; Marr, Crouch, D Clement, Carlos (2001). The content of the meetings is presented in Table 1.

**Table 1: Motivational Interview Content by Sessions**

<i>Sessions</i>	<i>Content</i>
<b>First</b>	Title: Introduce the change model. Goal: Increase awareness, teach the steps of the change model. Step 1: Introducing the motivational approach, Step 2: Explaining the group rules, Step 3: Do step-by-step exercise, Step 4: Determine the change steps of the client, Step 5 : End of the session and summary.
<b>Second</b>	Title: One day of living, Goal: To raise awareness, increase awareness of the client of quantity and frequency of drug use and patterns of use; Step 1 and 2: Start the meeting and introduce the title, Step 3: Describe a day of substance use, Step 4: Discussing a day of drugs use, Step 5: End of the session and summary.
<b>Third</b>	Title: Physiological effects of drug and drugs use. Goal: To increase awareness, to determine the rate of drugs and drug use in patients, to inform patients about

**Table 1: Motivational Interview Content by Sessions**

<i>Sessions</i>	<i>Content</i>
	the physiological effects of drug and drug use on the body. Step 1 and 2: Start the session and introduce the title, Step 3: Determine the amount of drugs and drug use by testing and scoring them. Step 4: Interpreting the results of drug and drug use tests. Step 5: End of the session and summary.
<b>Fourth</b>	Title: Expectations and concerns, Goal: To increase awareness and re-evaluate themselves, to inform clients about their expectations and beliefs about drugs use, Discussion of clients about the concerns of others about substance use, to reflect on expectations and concerns on drug use. Step 1 and 2: Start the meeting and introduce the title, Step 3: Identify the expectations associated with drug use and discuss these expectations, Step 4: Identify your concerns and others and discuss them, Step 5: Summarize and terminate the meeting.
<b>Fifth</b>	Title: Values, communications and roles, Goal: To re-evaluate self and environmental re-evaluation, to identify the personal values of the clients, and to determine the contradiction of their personal values with substance abuse behavior, to identify the relationship between the individual and his family, and to discuss the impact of their behavior on others, discussion of the members about the method of change of relationship and contemplation in this regard that the change of their relationship was as a result of drug abuse. Determine the roles of members and how they influence the use of substances on their roles. Step 1 and 2: Starting the meeting and introduce the title, Step 3: Determine personal values and their contradiction with the drug use behavior, Step 4: Identify current relationships and how to change relationships, Step 5: Determine the personal roles and the effect of drug use on their roles, Step 6: End of the session and summary.
<b>Sixth</b>	Title: Confidence and temptation, Goal: Self-efficacy, identification of tempting situations, evaluating clients of self-confidence to avoid consumption in tempting situations, discussing of clients about the different levels of temptation and self-esteem. Step 1 and 2: Starting the meeting and introducing the title, Step 3: Identifying temptation times and places, Step 4: Identify trust situations, Step 5: Compare confidence and temptation, Step 6: End of meeting.
<b>Seventh</b>	Title: Assessing the benefits and disadvantages. Goal: To learn the problem-solving and to determine the purpose for the readiness of change, self-efficacy, decision-making, self-liberalization, learning the process of determining and the importance of the benefits and disadvantages of behavior, learning the process of problem solving, learning to set goal and the select a goal to plan change. Step 1 and 2: Introduce and start the meeting, Step 3: Learn the process of measuring the benefits and disadvantages and importance of them, and measuring the decision balance, Step 4: Learning the problem solving process, Step 5: Set a goal and design a change program to achieve it, Step 6: Sumup and end of the session.
<b>Eights</b>	Title: Review and end, Goal: To review and discuss the topics raised at group meetings and progress of groups members, engagement in the final activities, steps 1 and 2: start the meeting and introduce the title, step 3: introduce the topics of the group meetings, step 4: Do exercise of change stages, Step 5: Summary and conclusion.

## Results

The descriptive statistics of the studied variables by groups and type of test are presented in Table 2.

**Table 2: Descriptive Statistics of the Studied Variables by Groups and Type of Test**

<i>Groups</i>	<i>Variables</i>	<i>Pre-test</i>		<i>Post-test</i>	
		<i>Mean</i>	<i>SD</i>	<i>Mean</i>	<i>SD</i>
<b>Control</b>	Craving	50/80	0/761	48/06	0/94
	Relapse	80/80	0/805	76/76	0/15
<b>Experiment</b>	Craving	50/50	0/731	41/73	0/99
	Relapse	80/73	0/583	71/36	0/56

Multivariate covariance analysis was used to evaluate the effectiveness of motivational interview on reducing craving and relapse in substance abusers under methadone treatment in Lamerd city. One of the assumptions of this analysis is the equality of covariance matrices. The results of the box test showed that this hypothesis was satisfied ( $M_{box} = 4.924$ ,  $P > 0.05$ ). Another assumption is the equality of error variances. The results of the Leven's test are presented in Table 3.

**Table 3: The Result of the Leven's Test for Variances Homogeneity**

<i>Variables</i>	<i>statistics F</i>	<i>Degree of freedom</i>	<i>Significance</i>
<b>Craving</b>	2/031	58	0/159
<b>Relapse</b>	1/409	58	0/240

As shown in Table 4, the results indicate that this assumption is satisfied ( $P > 0.05$ ). Therefore, multivariate covariance analysis was use and its results indicated a significant difference between the linear composition of the variables (Wilks lambda =2.185,  $F=60.091$ ,  $P < 0.001$ ). To investigate the difference models, uni-variate variance analysis was used in Table 4.

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

<i>Variables</i>	<i>Sum of squares</i>	<i>Degree of freedom</i>	<i>F statistics</i>	<i>Significance</i>
<b>Craving</b>	14/51	1	40/906	0/0005
<b>Relapse</b>	53/45	1	102/593	0/0005

As shown in Table 4, there is a significant difference in craving ( $F=40.906$ ,  $P < 0.001$ ) and relapse ( $F=40.906$ ,  $P < 0.001$ ). Regarding the descriptive statistics, it can be concluded that the motivational interview is effective and reduces the craving and relapse in substance abusers under methadone treatment.

### **Discussion and conclusion**

The results of the study confirmed the hypothesis of the research regarding the effect of motivational interview on reducing craving and relapse in substance abusers under methadone treatment.

Also, motivational interview with methadone therapy has a more decreasing effect than medication alone. Craving causes recurrent relapse during treatment that may occur during some periods, which means a strong desire to re-use or re-experience the substance. The results of the study showed that group motivational interview with methadone medication reduced craving in the experimental group more than the control group that used only pharmacotherapy and this led to the improvement of craving. The effect size of simultaneous use of methadone and motivational interview on craving was 0.72. One of the reasons for decreasing craving in patients is to increase their incentive to continue withdrawal and cope up with the hardships of quitting period. Meanwhile, the impact of motivational interview on reducing hesitation can also be a factor in reducing craving reported among participants. In addition, attending group meetings and dealing with other patients who are undergoing quitting process are also important in this regard. The results of this research are consistent with Arani and Rostami's (2010) research on the effectiveness of neurological feedback training in reducing craving in opiate dependent patients. Craving is a tendency to re-experience substance abuse that despairs the patient in the quitting process. In the experiment group, with tasks such as identifying triggers and drivers that cause the experience of craving, and identifying the tempting and difficult situations that a person experiences severe craving, they are more aware of the substance abuse than the control group, which increases their ability to fight against craving. (Wlaskowice, Maryn, ; Marr., Crouch, ; D Clement, 2008).

Also, in this study, methadone treatment combined with non-pharmacological treatment made motivational interview of changes more sustainable and faster, thereby reducing patients' drugs use dose during the therapy sessions in order to increase the psychological ability of the patients to cope up with craving.

One of the main current challenges in methadone maintenance treatment, which is the main and predominant treatment of addiction in the country, is the survival rate in the treatment or prevention of addiction relapse. Studies show that 20 to 90 percent of addicts under treatment experience relapse (Brown, 1998, Friedman et al., 1998, Ehsan Manesh and Karimi, 2009, Hosseini et al., 2010). Recent research, with regard to the frequent relapse rate, even with methadone treatment, is one of the important questions for research. The results showed that the motivational interview with pharmacotherapy compared to the application of pharmacotherapy alone reduced the number of relapses in a six-month follow-up and the effect size was 76%. Since the relapse scale consists of two factors of desire and temptation, the motivational interview has been able to



reduce relapse by reducing the desire and temptation of users. Craving increases the rate of relapse. The experience of coping with craving reduces relapse and prevents the return of consumption, as patients are therefore inclined to experience drugs in a tempting and hard situation and they return to drugs (West, 2006; Tiffany Drobz, 1999; Skinner, 2010). The final stages of change process are the stages of abstinence and not returning to drugs, which is designed due to repeated relapses in addicted patients. At this stage, the addict tries to prevent the return of addiction (Miller & Rollnick, 2012). During the group sessions for these processes, there are processes such as evaluating the benefits and disadvantages of the problem-solving process, the patient's familiarity with the tempting and difficult situations, the familiarity with the triggers and drivers, the setting of the goal and the change program (Vlascoes et al., 2008) increasing the abstinence period of addicts. These situations and tasks make the addict increase his chances of abstinence by knowing the desire and control of craving. According to researches, methadone treatment has a high percentage of relapse, because craving, in addition to being a physiological phenomenon, is mostly a psychological phenomenon. Therefore, pharmacotherapy alone is not enough to counteract craving (Hosseini et al., 2010; Ehsan Manesh and Karimi, 2009; Amini et al., 2002; Ghorbani, 2002); but the patient needs to find an inner motivation for change, and develop skills for craving situations.

The results of the decrease in craving and relapse of motivational interview in this study are consistent with the results of previous local researches on the effects of motivational interview on lifestyle changes of patients (Navidian, 2009), enhancing self-esteem and self-efficacy of addicted women (Dehghani Firoozabadi and colleagues, 2012), adherence to treatment (Mir Karimi et al., 2015), reduction of relapse in drugs dependent women (Firoozabadi et al., 2012), impulsivity reduction of unemployed drug abusers (Zare Manghabadi, 2012), weight loss in obese individuals (Navidian, 2009). Also, they are consistent with recent foreign research findings on the impact of motivational interview on the reduction and quitting medication, drugs, alcohol, and smoking (Star, Delucchi, Lichtmacher, Sterling, & Weisner, 2013; Osterman, & Dyehouse, 2012, Jensen et al., 2011, Lundahl, Kunz, Brownell, Tollefson, & Burke, 2010, Gary et al., 2005) and the reduction of harmful sexual behaviors (Fisher et al., 2006). The results of the research on the abstinence with motivational interview are similar to those of previous studies on the impact of motivational interview on increasing adherence to treatment and medication (West et al., 2007, Mirkarimi et al., 2015).

Experimental group learnt the skills of problem solving, evaluation of advantages and disadvantages, identification of triggers, goal setting etc. during the educational sessions to protect them against the craving temptation, thereby reducing the likelihood of relapse in this group, so by decreasing craving in the experimental group, the likelihood of relapse of decreases; therefore the dependent variables of this research are directly related to each other and as the

result of the effectiveness of the motivational interview, craving and, consequently, the probability of a lower relapse in the future in the experimental group were occurred.

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