

Effectiveness of Cognitive-Behavior Therapy on Depression and Craving Beliefs of Abusers Under Methadone Maintenance Treatment

Yousef Dehghani,^{1,*} and Soran Rajabi¹

¹Department of Psychology, Faculty of Humanities and Letters Science, Persian Gulf University, Bushehr, IR Iran

*Corresponding author: Yousef Dehghani, Department of Psychology, Faculty of Humanities and Letters Science, Persian Gulf University, Bushehr, IR Iran. Tel: +98-7731222147, E-mail: ydehghani@yahoo.com

Received 2015 June 03; Revised 2016 April 12; Accepted 2016 May 27.

Abstract

Objectives: This study aimed at investigating the effectiveness of cognitive-behavior therapy on depression and craving beliefs of abusers under methadone maintenance treatment, who referred to addiction treatment clinics of Bushehr city.

Methods: The statistical population of this research included all abusers, who referred to the addiction treatment centers (clinics) of Bushehr city. In regards to the research objectives, sampling was purposive and random. By referring to the addiction treatment clinics of Bushehr city, drug abusers were invited to participate in the study. The participants firstly completed the Beck depression inventory and craving questionnaire. Then, drug abusers with scores one standard deviation higher than the mean score of the Beck depression index and one standard deviation higher than the mean score of craving beliefs index, were selected. From this group, 20 qualified individuals were selected and divided randomly to two groups (experiment and control groups) and only the experimental group was intervened. After the intervention, both groups took part in the post-test. Data obtained from the research was analyzed by multivariate analysis of covariance (MANCOVA).

Results: Results showed that there was a significant difference between the experimental and control groups in terms of depression and temping beliefs ($P < 0.0001$). In other words, the results showed that cognitive-behavior therapy reduces depression and improves craving beliefs of abusers under methadone maintenance treatment.

Conclusions: The results emphasize the importance of the use of these interventions in abusers under methadone maintenance treatment and provide new horizons in clinical interventions.

Keywords: Cognitive Behavioral Therapy, Depression, Craving, Substance Abuser

1. Background

Drug abuse as a social issue, is a phenomenon that deteriorates the society's ability in organizing and keeping the existing discipline and causes structural transformations in economic, social, political and cultural systems (1). With a realistic attitude towards the issue of drug abuse, we can easily realize that this issue dates back to several centuries ago and currently there is no country, which stayed safe against its extension. This issue amongst important social damages in such a way that it not only endangers the health of individuals and the society, but also causes mental and moral degeneration of people (2-5).

One of the damages, which emerge as result of drug use, is depression among the abusers and consequently their family members. In the meantime, drug abuse may motivate the addicted person to reuse the drug while craving beliefs are considered one of facilitators of drug use (6). One of the subjects that are interesting for therapists at the time of referral of an addicted person is their negative be-

liefs (7). Existing documents show that people who are afflicted with drug abuse have a high rate of depression and this depression negatively affects their life quality (3).

There are many evidences indicating the relationship between drug abuse and depression (8-11). Also, craving beliefs is one of the common problems for addicted individuals, and studies have shown that almost two-thirds of addicted individuals, who underwent drug abuse treatment, reported having cravings (12-14).

During the last two decades, numerous psychological interventions have been developed for drug use and this issue indicates the effect and effectiveness of these interventions (15). Ordinary treatments of drug abuse include traditional treatments such as supportive treatments, psychodynamic, behavioral, cognitive models and cognitive-behavioral models. Among these, one of the treatments, which directly affects mental and spiritual health of drug abusers and is supported by many researches, is cognitive-behavior therapy (16). Cognitive-behavior therapy has led to a reduction in many issues and problems such as

weak communication within the family, unemployment, weak family supportive system, weakness in communicative skills and problems with drug abuse. As a result, this therapy can create a supportive atmosphere for those afflicted with drug abuse, and leads to drug addiction treatment. Family support is one of the most important matters, which assist with quitting drug abuse (17).

In view of the aforementioned points, the main issue of concern for this study was the effectiveness of cognitive-behavior therapy on depression reduction and craving beliefs of abusers under methadone maintenance treatment in Bushehr city and whether cognitive-behavior therapy can reduce depression and craving beliefs of abusers under methadone maintenance treatment of Bushehr city.

2. Objectives

This study was carried out to examine the effectiveness of cognitive-behavior therapy on depression and craving beliefs of abusers under methadone maintenance treatment.

3. Methods

The statistical population of this research included all abusers who referred to the addiction treatment centers (clinics) of Bushehr city. In regards to the research problem and objectives, the sampling method of the present study was purposive and random. For carrying out the present study, via referring to the addiction treatment clinics of Bushehr city, abusers who had a tendency to participate in this research plan were invited to attend the addiction treatment clinic specified for performing the research on a given date, so that they would take the test and be interviewed by the researcher and his/her colleagues. Those abusers, who referred to these clinics, firstly completed the Beck depression inventory and craving beliefs questionnaire. In the next stage, participants, whose scores were one standard deviation higher than the mean score of the Beck depression index and one standard deviation higher than the mean score of the craving beliefs questionnaire, were selected. The other inclusion criteria for the research were as follows: having an interest to participate in the study, being able to share their information and experiences, having commitment to treatment and therapy sessions, lack of known physical-mental illness, having literacy and finally, lack of critical or stressful event such as death of a loved one, divorce, disease, and migration within three months. Also, the criteria for exiting the research included the following: announcing

dissatisfaction to continue the cooperation with the researcher, risk of a serious health disorder, neurological disorders or psychosis and incomplete response to the questionnaire. Twenty qualified individuals were selected and divided randomly to two groups (experimental and control groups) and only the experimental group took part in the intervention and the control group was placed in the waiting list. It should be noted that the sample size according to Cohen's table with 0.8 statistical power, effect size of 0.8, and alpha level of 0.05, was calculated for each group as 10 individuals (after finishing the program of cognitive-behavior psychotherapy for the experimental group, the control group and those abusers who were not allocated to any of the groups, also underwent cognitive-behavior treatment). Once the experimental group completed the intervention program, both groups took the post-tests. During the experiment, all subjects participated actively in the experiment, and no dropout occurred. It should also be noted that researchers had a PhD in psychology and necessary expertise in the considered field as well as professional experience in addiction treatment centers to perform the training sessions. The cognitive-behavioral therapy that was used in this study consisted of ten sessions (two sessions a week and 45 minutes for each session), for the experimental group. The content of the study sessions was based on cognitive-behavioral approach, within the framework by Wildermuth. This treatment includes programs concerned with thoughts, feelings, behavior of patients, reconstruction thoughts, signs and chains, impulsivity and self-control, and improves mood, stress management and problem solving and self-esteem (18). Beck depression inventory (13-item version) and craving beliefs questionnaire (CBQ) were used.

3.1. Beck Depression Inventory (13-item version)

This questionnaire is the summarized version of the 21-item version (Beck, 1961), which was introduced in 1972 (19). Content of the questionnaire includes sadness, pessimism, frustration, unhappiness, guilt, self-hate, self-destructive, social resignation, indecision, self-image, job problem, fatigue and appetite. Each question has four choices to be answered for which the scores are 0, 1, 2 and 3. A person's score is the sum of all scores obtained from the questions (11). For implementing the test, the subjects were asked to read the questions and choices of every question one by one and carefully. Then, the participants were to select a choice for each question, which expressed their current feeling better than the other choices; i.e. what they felt at the time of the test. Then they were to encircle the number before that choice. For calculating the results, the psychologist summed all scores that the subject had encircled. Since in each question, three is the highest score, and the number

of items is 13, therefore, the maximum possible score is 39. Scores of 0 to 4 indicated a normal state, 5 to 7 mild depression, 8 to 15 average depression and higher than 16 acute depression. Dagher and Green (20) reported reliability and internal similarity of 0.83 for the 13-item Beck depression Inventory. Through implementing this questionnaire on a sample of students of Ahvaz city, reliability coefficient of 0.89 was obtained by using the Cronbach's Alpha and 0.87 was obtained by the split-half method.

3.2. Craving Beliefs Questionnaire (CBQ)

This questionnaire was a self-measuring scale, which measured beliefs related to drug craving and consisted of 20 items, each of which is ranked on a 1-7 degree scale (from strongly disagree to strongly agree). Reliability of this questionnaire was reported as 0.84 based on the Cronbach's Alpha (12).

In the final step of data using descriptive and inferential statistics and repeated measure MANCOVA in SPSS 18 software were analyzed.

4. Results

In this section, mean, standard deviation, highest and lowest scores of subjects in depression and craving beliefs are presented. Table 1 shows mean and standard deviation scores of depression in the control and experimental groups both in pre- and post-tests.

Table 1. Mean and Standard Deviation of Depression Amongst the Subjects in Pre-test and Post-test Scores^a

Group	Pre-test	Post-test
Experimental	11.4 ± 4.08	3.53 ± 1.40
Control	9.13 ± 3.88	9.93 ± 3.05

^aAll data are presented as Mean ± SD.

Table 2 shows that mean and standard deviation for scores of craving beliefs in control and experimental groups in pre- and post-tests.

Table 2. Mean and Standard Deviation of Craving Beliefs Amongst the Subjects in Pre-test and Post-test Scores^a

Group	Pre-test	Post-test
Experimental	81.30 ± 10.39	74.60 ± 7.56
Control	73.73 ± 6.67	72.71 ± 5.26

^aAll data are presented as Mean ± SD.

In the current study, multivariate analysis of covariance (MANCOVA) method was used for testing the hypotheses and determining the significance of the difference between experiment and control groups' scores in variables of depression and craving beliefs.

Table 3 indicates that there was a significant difference between experimental and control groups in terms of dependent variables at $P = 0.001$. Based on this, it can be said that there is a significant difference at least in one of dependent variables (depression and craving beliefs) between the two groups. In determine this, two covariance analyses were carried out in MANCOVA context of which the results are given in Tables 4 and 5. Additionally, effect size index showed that 73% of the difference between the two groups was related to the experimental intervention.

In regards to Table 4, from the column "significance level", it can be observed that there was a significant difference between experimental and control groups in terms of variable of depression at $P = 0.001$. Based on this, the hypothesis can be accepted.

In Table 5, from the column "significance level", it can be observed that there was a significant difference between experimental and control groups in terms of variable of craving beliefs at $P = 0.006$.

5. Discussion

The present study was planned in order to investigate the effectiveness of cognitive-behavior therapy on depression, and craving beliefs among drug abusers under methadone maintenance treatment. Results of this study are consistent with other researchers (2, 5, 21-23). In line with the elaboration obtained from the results of this research, it can be said that cognitive-behavior therapy leads to depression reduction and craving beliefs improvement among the patients through training anger control, courageous behavior, problem-solving skills, self-control skills and momentum control as well as training relaxation.

Moreover, the results showed that cognitive-behavior therapy reduces the depression of abusers under methadone maintenance treatment. The results of this research are consistent with other researches (8-11). In line with the elaboration obtained from the results of this research, it can be said that depression involves negative thoughts about self, present time and future experiences. Negative thoughts about self are: beliefs of depressed people in their insufficiency and imperfection, and thus the inability to reach happiness. The negative thoughts of depressed people include their interpretations of events. They believe that negative obstacles are impossible to overcome, even when there are more rational positive

Table 3. Results Obtained from Multivariate Analysis of Covariance on the Mean of Post-Test Scores of Depression and Craving Beliefs Among the Subjects of Experimental and Control Groups

Test Name	Value	F	df Hypothesis	dferror	Effect Size	Statistical Power	Level of Significance
Pillai Trace	0.73	35.29	2	25	0.73	1	0.001
Wilks' lambda	0.26	35.29	2	25	0.73	1	0.001
Hotelling's Trace	2.82	35.29	2	25	0.73	1	0.001
Roy's largest root	2.82	35.29	2	25	0.73	1	0.001

Table 4. Results Obtained from the Analysis of Covariance within Multivariate Analysis of Covariance Context on the Mean of Post-Test Scores of Depression of Subjects in the Experimental and Control Groups

Variable	Change Source	Sum of Squares	df	Mean of Squares	F	Effect Size	Statistical Power	Sig
Depression	Pre-test	30.48	1	30.48	6.70	0.20	0.70	0.016
	Group	328.24	1	328.24	72.17	0.73	1	0.001
	Error	118.24	26	4.55				

Table 5. Results Obtained From the Analysis of Covariance within Multivariate Analysis of Covariance Context on the Mean of Post-Test Scores of Craving Beliefs of Subjects in the Experimental and Control Groups

Variable	Change Source	Sum of Squares	df	Mean of Squares	F	Effect Size	Statistical Power	Sig
Depression	Pre-test	18.99	1	18.99	0.41	0.20	0.09	0.526
	Group	405.17	1	405.17	8.82	0.73	1	0.006
	Error	1193.9	26	45.92				

views on their experience. They make a negative interpretation of what has occurred for them. Finally, the negative attitude of depressed people is about a future of prostration. When they think of the future, they believe that the negative events occurring currently they will continue in the future due to their personal deficiency (10). In fact, behavior-cognitive therapy emphasizes on the negative tendency in information processing, which results from a distorted interpretation of themselves, environment and the future. Most recent views support a model that focuses on the relationship between nature of depression events and patients' interpretations of these events. The behavior cognitive technique reinforces planning for objectives and reduces depression by challenging negative thoughts (24).

Furthermore, the results showed that cognitive-behavior therapy improves the craving beliefs of abusers under methadone maintenance treatment. Results of this research are consistent with other researches (8-11). Craving beliefs are assumptions and orientation beliefs that people have towards themselves, peripheral world and the future. As a result, these attitudes orient the person's understanding and perception of events and also directly influence the strategies for confronting stress and con-

sequently reduce the persons' resources for countering stress and affect emotions and behaviors and make the person prone to depression and other psychological disorders. In line with the elaboration obtained from the results of this research, it can be said that based on the researches; frequent use of drugs is affected by beliefs and attitudes of patients. Some researches have shown that people's beliefs are consistent with their cognitive and emotional responses (25). Drug craving beliefs, due to their importance in interpretation of specific situations, have special settings. According to Beck cognitive theory, these beliefs include negative cognitive designs (which is shown in low self-esteem) and abstract, stable and irrational opinions and beliefs (which refers to inefficient attitudes). Inefficient attitudes are orientation assumptions and beliefs that people have towards themselves, peripheral world and the future. Therefore, since it is accompanied by negative assessment of people of themselves, world and future, this variable can play a role in compatible and incompatible behaviors like frequent use of drugs. The amount of negative self-perception thoughts is more frequent in addicted people, which in turn causes consequences like frequent use of drugs. In fact, the more negative self-perception thoughts, the higher possibility that the person afflicts

with drug use and behavioral problems resulting from it.

The present research was implemented on people who had been involved in drug abuse under methadone maintenance treatment; therefore, it is not generalizable to the other groups. Also, this study was carried out among the abusers of Bushehr city; hence, it is not generalizable to other cities. In addition, due to the time constraints, performing the follow-up to evaluate the effectiveness of cognitive-behavioral training over time was not possible. The results emphasize the importance of the use of these interventions in abusers under methadone maintenance treatment and provide new horizons in clinical interventions. Therefore, it is recommended for this method to be used in medical centers by mental health professionals. It is recommended for future medical research to study other groups with psychological training, medication and placebo in the treatment group and control, to enable further comparisons to be made. Moreover, future researches should investigate the role of personality characteristics, such as psychological hardness and self-expression (that seem to be significant) in tendency to addiction.

Acknowledgments

The authors sincerely thank all the subjects, who contributed to this study.

References

- Russell C, Davies JB, Hunter SC. Predictors of addiction treatment providers' beliefs in the disease and choice models of addiction. *J Subst Abuse Treat.* 2011;**40**(2):150-64. doi: [10.1016/j.jsat.2010.09.006](https://doi.org/10.1016/j.jsat.2010.09.006). [PubMed: [21036516](https://pubmed.ncbi.nlm.nih.gov/21036516/)].
- Kelley ML, Fals-Stewart W. Couples- versus individual-based therapy for alcohol and drug abuse: effects on children's psychosocial functioning. *J Consult Clin Psychol.* 2002;**70**(2):417-27. [PubMed: [11952200](https://pubmed.ncbi.nlm.nih.gov/11952200/)].
- Besharat MA, Ranjbarnowshahri F, Rostami R. Comparison of family functioning in patients with substance abuse disorder and a normal family. *J Psychol Edu.* 2008;**38**(3):13-56.
- Lemke S, Schutte KK, Brennan PL, Moos RH. Gender differences in social influences and stressors linked to increased drinking. *J Stud Alcohol Drugs.* 2008;**69**(5):695-702. [PubMed: [18781244](https://pubmed.ncbi.nlm.nih.gov/18781244/)].
- Jaremko KM, Sterling RC, Van Bockstaele EJ. Psychological and physiological stress negatively impacts early engagement and retention of opioid-dependent individuals on methadone maintenance. *J Subst Abuse Treat.* 2015;**48**(1):117-27. doi: [10.1016/j.jsat.2014.08.006](https://doi.org/10.1016/j.jsat.2014.08.006). [PubMed: [25239858](https://pubmed.ncbi.nlm.nih.gov/25239858/)].
- Fals-Stewart W, Lam WKK, Kelley ML. Learning sobriety together: Behavioural couples therapy for alcoholism and drug abuse. *J Fam Ther.* 2009;**31**(2):115-25.
- Moshier SJ, Ewen M, Otto MW. Impulsivity as a moderator of the intention-behavior relationship for illicit drug use in patients undergoing treatment. *Addict Behav.* 2013;**38**(3):1651-5. doi: [10.1016/j.addbeh.2012.09.008](https://doi.org/10.1016/j.addbeh.2012.09.008). [PubMed: [23254213](https://pubmed.ncbi.nlm.nih.gov/23254213/)].
- Ortiz-Gomez LD, Lopez-Canul B, Arankowsky-Sandoval G. Factors associated with depression and suicide attempts in patients undergoing rehabilitation for substance abuse. *J Affect Disord.* 2014;**169**:10-4. doi: [10.1016/j.jad.2014.07.033](https://doi.org/10.1016/j.jad.2014.07.033). [PubMed: [25128860](https://pubmed.ncbi.nlm.nih.gov/25128860/)].
- Chen G, Gueta K. Child abuse, drug addiction and mental health problems of incarcerated women in Israel. *Int J Law Psychiatry.* 2015;**39**:36-45. doi: [10.1016/j.ijlp.2015.01.019](https://doi.org/10.1016/j.ijlp.2015.01.019). [PubMed: [25660063](https://pubmed.ncbi.nlm.nih.gov/25660063/)].
- Nikulina EM, Johnston CE, Wang J, Hammer RJ. Neurotrophins in the ventral tegmental area: Role in social stress, mood disorders and drug abuse. *Neuroscience.* 2014;**282**:122-38. doi: [10.1016/j.neuroscience.2014.05.028](https://doi.org/10.1016/j.neuroscience.2014.05.028). [PubMed: [24875178](https://pubmed.ncbi.nlm.nih.gov/24875178/)].
- Kim KE, Choi JH, Kim YH. Effect of infant health problem, mother's depression and marital relationship on infant abuse in Korea: mediating pathway of marital relationship. *Asian Nurs Res (Korean Soc Nurs Sci).* 2014;**8**(2):110-7. doi: [10.1016/j.anr.2014.05.001](https://doi.org/10.1016/j.anr.2014.05.001). [PubMed: [25030643](https://pubmed.ncbi.nlm.nih.gov/25030643/)].
- Nosen E, Woody SR. Acceptance of cravings: how smoking cessation experiences affect craving beliefs. *Behav Res Ther.* 2014;**59**:71-81. doi: [10.1016/j.brat.2014.05.003](https://doi.org/10.1016/j.brat.2014.05.003). [PubMed: [25014920](https://pubmed.ncbi.nlm.nih.gov/25014920/)].
- Kennedy AP, Epstein DH, Phillips KA, Preston KL. Sex differences in cocaine/heroin users: drug-use triggers and craving in daily life. *Drug Alcohol Depend.* 2013;**132**(1-2):29-37. doi: [10.1016/j.drugalcdep.2012.12.025](https://doi.org/10.1016/j.drugalcdep.2012.12.025). [PubMed: [23357742](https://pubmed.ncbi.nlm.nih.gov/23357742/)].
- Singh D, Muller CP, Vicknasingam BK. Kratom (*Mitragyna speciosa*) dependence, withdrawal symptoms and craving in regular users. *Drug Alcohol Depend.* 2014;**139**:132-7. doi: [10.1016/j.drugalcdep.2014.03.017](https://doi.org/10.1016/j.drugalcdep.2014.03.017). [PubMed: [24698080](https://pubmed.ncbi.nlm.nih.gov/24698080/)].
- Alleva L, Tirelli E, Brabant C. Therapeutic potential of histaminergic compounds in the treatment of addiction and drug-related cognitive disorders. *Behav Brain Res.* 2013;**237**:357-68. doi: [10.1016/j.bbr.2012.09.025](https://doi.org/10.1016/j.bbr.2012.09.025). [PubMed: [23000530](https://pubmed.ncbi.nlm.nih.gov/23000530/)].
- Xu TR, Yang Y, Ward R, Gao L, Liu Y. Orexin receptors: multi-functional therapeutic targets for sleeping disorders, eating disorders, drug addiction, cancers and other physiological disorders. *Cell Signal.* 2013;**25**(12):2413-23. doi: [10.1016/j.cellsig.2013.07.025](https://doi.org/10.1016/j.cellsig.2013.07.025). [PubMed: [23917208](https://pubmed.ncbi.nlm.nih.gov/23917208/)].
- Oei TP, McAlinden NM, Cruwys T. Exploring mechanisms of change: the relationships between cognitions, symptoms, and quality of life over the course of group cognitive-behaviour therapy. *J Affect Disord.* 2014;**168**:72-7. doi: [10.1016/j.jad.2014.06.040](https://doi.org/10.1016/j.jad.2014.06.040). [PubMed: [25038294](https://pubmed.ncbi.nlm.nih.gov/25038294/)].
- Fals-Stewart W, O'Farrell TJ, Birchler GR, Cordova J, Kelley ML. Behavioral couples therapy for alcoholism and drug abuse: Where we've been, where we are, and where we're going. *J Cogn Psychother.* 2005;**19**(3):229-46.
- Beck AT, Steer RA, Carbin MG. Psychometric properties of the Beck Depression Inventory: Twenty-five years of evaluation. *Clinical Psychol Rev.* 1988;**8**(1):77-100.
- Dagher RK, Green KM. Does depression and substance abuse comorbidity affect socioeconomic status? Evidence from a prospective study of urban African Americans. *Psychiatry Res.* 2015;**225**(1-2):115-21. doi: [10.1016/j.psychres.2014.10.026](https://doi.org/10.1016/j.psychres.2014.10.026). [PubMed: [25467698](https://pubmed.ncbi.nlm.nih.gov/25467698/)].
- Cox WM, Klinger E, Fardari JS. The motivational basis of cognitive determinants of addictive behaviors. *Addict Behav.* 2015;**44**:16-22. doi: [10.1016/j.addbeh.2014.11.019](https://doi.org/10.1016/j.addbeh.2014.11.019). [PubMed: [25499579](https://pubmed.ncbi.nlm.nih.gov/25499579/)].
- Svartvatten N, Segerlund M, Denhag I, Andersson G, Carlbring P. A content analysis of client e-mails in guided internet-based cognitive behavior therapy for depression. *Internet Intervent.* 2015;**2**(2):121-7.
- Singer AR, Addington DE, Dobson KS, Wright C. A pilot study of cognitive behavior therapy for depression in early psychosis. *Cog Behav Pract.* 2014;**21**(3):323-34.
- Mullin A, Dear BF, Karin E, Wootton BM, Staples LG, Johnston L, et al. The UniWellbeing course: A randomised controlled trial of a transdiagnostic internet-delivered cognitive behavioural therapy (CBT) programme for university students with symptoms of anxiety and depression. *Internet Intervent.* 2015;**2**(2):128-36.
- Martel MO, Dolman AJ, Edwards RR, Jamison RN, Wasan AD. The association between negative affect and prescription opioid misuse in patients with chronic pain: the mediating role of opioid craving. *J Pain.* 2014;**15**(1):90-100. doi: [10.1016/j.jpain.2013.09.014](https://doi.org/10.1016/j.jpain.2013.09.014). [PubMed: [24295876](https://pubmed.ncbi.nlm.nih.gov/24295876/)].