Effects of Self-Control Training on Emotional Wellbeing and Opioid Craving Among Men with Opioid Use Disorder

Hadis Yousefi [1], Mohammad Ghaderi Rammazi [2, *], Abbas Abolghasemi [3] and Kouros Divsalar [1]

[1] Neuroscience Research Center, Institute of Neuropharmacology, Kerman University of Medical Sciences, Kerman, Iran
[2] Department of Educational Sciences, Farhangian University, Kerman, Iran
[3] Department of Psychology, Guilan University, Guilan, Iran

Corresponding author: Department of Educational Sciences, Farhangian University, Kerman, Iran. Tel: +98-9133962979, Fax: +98-3432264198, Email: mohammade_ghaderi@yahoo.com

Abstract

Background: Today, opioid use is recognized as a global concern, threatening people's physical and mental health.

Objectives: This study was conducted to investigate the effects of self-control training on emotional wellbeing and opioid craving among men with opioid use disorder.

Methods: In this quasi experimental study, the sample included all men with opioid use disorder, who were admitted to drug treatment centers of district 6, Tehran, Iran during year 2015. Fifty subjects were initially selected, matched, and randomly assigned to experimental and control groups (25 cases per group). After a diagnostic interview, the subjects were asked to complete the pretests, including the cognitive emotion regulation questionnaire (CERQ), facial expression recognition test (FERT), emotional processing scale (EPS), toronto alexithymia scale (TAS), and craving beliefs questionnaire (CBQ). The experimental group participated in 10 weekly sessions of self-control training. A week after the intervention, both groups were tested using the same instruments. For data analysis, multiple analysis of variance (MANOVA) test was applied in SPSS version 18.

Results: Self-control training caused a significant increase in positive emotion regulation (P < 0.001), emotion recognition (P = 0.002), and emotion processing (P < 0.001), while reducing negative emotion regulation (P = 0.002), alexithymia (P < 0.001), and opioid craving in men with opioid use disorder (P < 0.001).

Conclusions: Self-control training exerts a significant effect on the improvement of emotional wellbeing in men with opioid use disorder and reduces their opioid craving.

Keywords: Craving, Emotional Wellbeing, Iran, Opioid Use Disorder, Self-Control

1. Background

Today, despite considerable advances in the treatment of addictive behaviors, opioid use remains a global concern, jeopardizing people's physical and mental health (1, 2). Among all the studied factors, emotional wellbeing has attracted a great deal of attention in the etiology of opioid use in the recent years. According to previous studies, people with poor emotional wellbeing are more vulnerable to different types of addiction disorders, compared to their normal counterparts (3).

Craving or compulsory mental desire for drug use plays a crucial rule in the etiology and treatment of addictive behaviors. Apparently, craving has a close relationship with factors, which emotionally increase the risk of opioid use, such as stress, impulsiveness, attentional bias, and emotional dysregulation. Therefore, for a treatment to be effective in reducing opioid craving, it should consider the underlying factors. Meanwhile, self-control training, as a combination of cognitive therapy and assertive training (4), can teach people how to manage their emotions, predict their behaviors, and reward themselves to cope with craving (4).

The effectiveness of self-control training has been confirmed in the treatment of drug abuse problems (5, 6). The constructive role of treatment has been tangible in the improvement of emotion regulation (7).

2. Objectives

Despite some attempts, a few studies, especially in Iran, have examined the effect of this treatment on opioid use disorder. Therefore this study was performed to fill this research gap and to investigate the effects of self-

control training on emotional wellbeing and opioid craving among men with opioid use disorder.

3. Materials and Methods

3.1. Study Design

In this study, a quasi-experimental design was applied.

3.2. Population and Sampling

The study population consisted of all male patients with opioid use disorder, admitted to drug treatment centers of district 6, Tehran, Iran. First, three centers were randomly selected from seven centers in the district. Among patients admitted to these centers (n, 104), 50 were selected, matched, and randomly assigned to experimental and control groups (25 subjects per group). For ethical considerations, informed consents were obtained from all the subjects. As participation in the study was completely voluntary, 16 subjects were absent for more than one session (based on the exclusion criteria) and were excluded from the study. The remaining 34 subjects (17 subjects per group) constituted the final sample.

Inclusion and exclusion criteria

The most important inclusion criteria were as follows: (1) male gender, (2) age range of 20 to 50 years old, (3) history of opioid use (at least two years) (4) withdrawal attempts (at least one attempt), (5) type of drug (opium, heroin, and crack), and (6) literacy (primary education at least). On the other hand, participants with any other physical or psychiatric disorders, as well as those, who were absent for more than one session, were excluded from the study.

3.3. Study Process

In the first step of the intervention, both groups were exposed to pretests. The experimental group participated in 10 weekly sessions of self-control training (45 minutes per session), while the control group remained on the waiting list for treatment. A week following the intervention, both groups were tested using the same instruments. In order to perform self-control training, a combination of lectures and role-play, as instructed by Leahy et al., was adopted (8).

The training included: (1) organizing the training groups and planning the sessions (first session), (2) prioritizing the treatment goals (second session), (3) teaching self-evaluation skills (third session), (4) teaching self-monitoring skills (fourth session), (5) teaching self-reinforcement methods (fifth session), (6) teaching self-guided training (sixth session), (7) teaching self-modeling (seventh session), (8) identifying the craving stimulants (eighth session), (9) teaching problem-solving skills (ninth session), and (10) reviewing and reappraising the treatment plans (tenth session).

3.4. Data Collection Tools

3.4.1. Diagnostic Interview

A diagnostic interview, based on the latest version of the diagnostic and statistical manual of mental disorders (DSM-5), was conducted in order to create a primary therapeutic alliance, identify the subjects, and ensure their addiction, poor emotional wellbeing, and high opioid craving. This interview was used to match the subjects and assign them to control and experimental groups.

3.4.2. Cognitive Emotion Regulation Questionnaire

The cognitive emotion regulation questionnaire (CERQ) was constructed by Garnefski and Kraaij in 2006 to measure positive and negative emotion regulation styles. This questionnaire includes 18 items, scored on a five-point Likert scale. The Cronbach's alpha coefficient for reliability ranges from 0.78 to 0.83 (0.84 for all the scale) in this questionnaire (9). In the Iranian version, Cronbach's alpha coefficients ranged between 0.68 and 0.86, while reliability and validity coefficients were estimated at 0.73 and 0.88, respectively (10).

3.4.3. Facial Expression Recognition Test

Facial expression recognition test (FERT), which was first developed by Ekman and Friesen (1987), contains 36 pictures and measures six major emotions. By looking at each picture, the respondent should recognize the conveyed emotion (11). The test-retest reliability coefficients (one-week interval) were measured at 0.85 and 0.71 in a study conducted in Iran (11). The content validity of this instrument was also reported to be satisfactory.

3.4.4. Emotional Processing Scale

Emotional Processing Scale is a 25-item self-report scale, first developed by Bakeret al. to measure emotional processing styles (5). This instrument is scored on a five-point Likert scale and consists of four subscales, with higher scores signifying superiority in emotion processing (6). This scale has shown high internal consistency (0.88 to 0.92) and good test-retest reliability (12). In a study performed in Iran, Cronbach's alpha coefficient for internal consistency was calculated as 0.92. In order to assess the validity, the instrument was correlated with emotional processing scale (EPS), and a significant negative correlation was observed between the instruments (r, 0.54; P < 0.05) (5).

3.4.5. Toronto Alexithymia Scale

Toronto alexithymia scale is composed of 20 items assessing alexithymia. This scale is scored on a five-point Likert scale (one to five) and has acceptable reliability and validity. In a study performed in Iran, Cronbach's alpha coefficient for internal consistency was 0.85, and concurrent validity for the scale correlation with emotional quotient, emotional wellbeing, and psychological helplessness questionnaires was -0.80, -0.78, and 0.44, respectively (13); all these values were significant at 0.05.

3.4.6. Craving Beliefs Questionnaire

This 20-item instrument (scored on a seven-point scale), which was first designed by Beck et al. (1993), is a self-report questionnaire for the measurement of opioid craving. Discriminative validity was confirmed by comparing the findings of a craving beliefs questionnaire (CBQ) survey on alcohol addicts, social drinkers, and non-drinkers (14). In order to evaluate reliability, internal consistency of the questionnaire was determined (0.75). In a study performed in Iran, the content validity and reliability of the questionnaire (Cronbach's alpha coefficient and test-retest methods) were reported to be satisfactory (0.84 and 0.81, respectively) (15).

3.5. Data Analysis

The obtained data were analyzed in SPSS version 18, using multiple analysis of variance (MANOVA) test.

4. Results

Based on the demographic information, the mean age of the participants was 33.25 ± 7.12 years in the control group and 35.20 ± 5.59 years in the experimental group. In total, 35.29%, 47.05%, and 17.64% of the subjects were taking crack, opium, and heroin in the control group, respectively, while the corresponding values in the experimental group were 47.05%, 29.14%, and 35.29%, respectively. Other descriptive data of the groups (including mean and standard division) are presented in Table 1.

Considering the normal distribution of data based on Kolmogorov-Smirnov test (P > 0.05), MANOVA test was applied to draw comparisons between the mean scores of the groups. Prior to that, Levene's test was used to assess the homogeneity of variances. P value was not significant for any of the variables (Table 2).

The results of Wilks' Lambda test (Table 3) indicated that the difference between the control and experimental groups was significant for at least one variable (Wilk's Lambda, 0.22; F, 15.67; P < 0.0001). As it can be inferred from partial eta squared, the interaction of dependent variables accounted for 78.3% of variance in the difference between the groups.

As presented in Table 4, the results of MANOVA test were indicative of a significant difference between the mean scores of the groups for all the studied variables, including negative emotion regulation (F, 5.950; P = 0.002), positive emotion regulation (F, 1.474; P < 0.001), emotion recognition (F, 10.725; P = 0.002), emotion processing (F, 1.425; P < 0.001), alexithymia (F, 0.129; P < 0.001), and craving (F, 0.833; P < 0.001). Therefore, self-control training significantly augmented positive emotion regulation, emotion recognition, and emotion processing in the experimental group and substantially decreased their negative emotion regulation, alexithymia, and craving.

5. Discussion

The aim of the present study was to investigate the effects of self-control training on emotional wellbeing and opioid craving among people with opioid use disorder. One important finding of the present study was that self-control training could increase positive emotion regulation and decrease negative emotion regulation. These findings are in accordance with some previous studies (5, 6, 16, 17), which have shown that low levels of positive emotion regulation in people with opioid use disorder can be attributed to their inability to manage their emotions and effectively face their negative emotions, especially in the early stages of drug addiction (17).

Considering the fact that addicts cannot predict the possible consequences of drug addiction, particularly due to their impulsivity and irritability, improvement of emotion regulation skills through self-control training plays an essential role in the prevention of relapse; in fact, self-control training can reduce feelings of anger, impulsivity, craving, and cognitive bias (6).

The present study showed that self-control training could improve emotion recognition skills. This finding is in line with the results of a study by Marich (18). According to various studies, opioid addicts not only have less competence to identify (19, 20) or decode other people's emotions (21), yet they also have problems communicating their emotions (19). These problems undermine their self-esteem to an extent that they cannot establish a healthy relationship with others (21). Self-control training, by providing a pleasant atmosphere for treatment, helps patients become more cognizant of their emotions and other people's feelings. Moreover, it teaches them how to express their emotions and interact with others in order to establish a close interpersonal relationship without any negative thoughts or fear of rejection by others.

Table 1. The Descriptive Data of the Study Groups[a]

Variables	Control Group		Experimental Group	
	Pretest	**Posttest**	**Pretest**	**Posttest**
Negative emotion regulation	31.56 ± 4.46	30.92 ± 4.48	29.27 ± 4.04	27.92 ± 3.93
Positive emotion regulation	18.59 ± 6.35	20.41 6.6± 6.6	23.73 ± 5.28	34.21 ± 4.56
Emotion recognition	27.58 ± 2.4	28.82 2.92± 2.92	27.09 ± 3.01	29.72 ± 1.87
Emotion processing	76.58 ± 13.28	78.88 ± 10.27	73.64 ± 14.45	80.64 ± 13.52
Alexithymia	65.53 ± 11.9	64.01 ± 12.98	64.13 ± 15.57	59.21 ± 14.05
Craving	83.82 ± 29.92	81.94 ± 34.45	83 ± 20.31	76.88 ± 32.12

[a]Values are expressed as mean ± SD.

Table 2. The Results of Levene's Test

Variables	F	Df1	Df2	P Value
Negative emotion regulation	1.61	1	31	0.21
Positive emotion regulation	0.50	1	31	0.49
Emotion recognition	0.03	1	31	0.87
Emotion processing	0.04	1	31	0.84
Alexithymia	0.47	1	31	0.51
Craving	0.11	1	31	0.74

Table 3. The Results of Wilks' Lambda Test

Test	P Value	F	P Value	Partial Eta Squared
Wilks' Lambda	0.22	15.67	0.0001	0.783

Moreover, the results of the present study showed that self-control training decreased alexithymia while increasing emotional processing, which is consistent with some previous studies (6, 7, 22). The positive effect of self-control training on emotion arises from at least three factors: First, self-control training provides some standards for a person with opioid use disorder; second, it helps the person pay attention to his/her behaviors; and third, it boosts one's strength and ability to make the desired changes (7).

Finally, in line with some previous studies (7, 18), the present results showed that self-control training decreased craving for opioid use. The subjects' increased awareness of tempting situations and their knowledge of how to respond to these situations are probably the most effective factors in reaching this conclusion (6). Techniques, such as the use of relaxation techniques at times of anxiety, knowledge of self-reinforcement methods, and diverting attention from opioid use, are also of paramount importance in decreasing craving.

Based on the mentioned findings, opioid use disorder is a health concern in Iran, as the most populous Persian Gulf country. Therefore, it is suggested to provide cogni-

tive behavioral therapy to reduce this problem. Some studies have confirmed the effectiveness of cognitive behavioral therapy in reducing drug use problems (23-25); similar studies are suggested among opioid users of Iran.

5.1. Conclusions

Self-control training by combining different cognitive techniques and improving assertiveness in a relaxed atmosphere plays a pivotal role in increasing emotional wellbeing and decreasing craving for opioid use.

5.2. Limitations

Considering the time limitations of this study, no follow-up was performed. In addition, the study was confined to male participants and those solely living in Tehran, therefore, interpretation of the results may be limited. Further investigation of both males and females, along with a follow-up, is suggested in future studies.

Acknowledgments

Table 4. The Results of Multiple Analysis of Variance Test

Source of Variation/Dependent Variable	SS	DF	MS	F	P Value
Model					
Negative emotion regulation	68.228	1	68.228	0.393	0.001
Positive emotion regulation	70.945	1	70.945	1.252	0.001
Emotion recognition	213.706	1	213.706	71.87	0.004
Emotion processing	831.531	1	831.531	35.87	0.004
Alexithymia	240.742	1	240.742	0.349	0.005
Craving	1367.872	1	1367.872	0.348	0.001
Group					
Negative emotion regulation	185.107	1	185.107	5.950	0.002
Positive emotion regulation	83.551	1	83.551	1.474	0.001
Emotion recognition	31.888	1	31.888	10.725	0.002
Emotion processing	98.440	1	98.440	1.425	0.001
Alexithymia	0.984	1	0.984	0.129	0.001
Craving	68.478	1	68.478	0.833	0.001
Error					
Negative emotion regulation	964.408	31	31.109		
Positive emotion regulation	1756.691	31	56.667		
Emotion recognition	92.173	31	2.973		
Emotion processing	7186.529	31	231.824		
Alexithymia	3405.985	31	109.870		
Craving	6703.765	31	216.250		

Footnotes

References

1. Springer SA, Larney S, Alam-Mehrjerdi Z, Altice FL, Metzger D, Shoptaw S. Drug treatment as HIV prevention among women and girls who inject drugs from a global perspective: progress, gaps, and future directions. *J Acquir Immune Defic Syndr*. 2015;**69 Suppl 2**:S155–61. doi: 10.1097/QAI.0000000000000637. [PubMed: 25978482]. [PubMed Central: PMC4443704].

2. Alam-Mehrjerdi Z, Abdollahi M, Higgs P, Dolan K. Drug use treatment and harm reduction programs in Iran: A unique model of health in the most populated Persian Gulf country. *Asian J Psychiatr*. 2015;**16**:78–83. doi: 10.1016/j.ajp.2015.06.002. [PubMed: 26168763].

3. Wilens TE, Martelon M, Anderson JP, Shelley-Abrahamson R, Biederman J. Difficulties in emotional regulation and substance use disorders: A controlled family study of bipolar adolescents. *Drug Alcohol Depend*. 2013;**132**(1-2):114–21. doi: 10.1016/j.drugalcdep.2013.01.015. [PubMed: 23422834]. [PubMed Central: PMC3683118].

4. Wiers RW, Gladwin TE, Hofmann W, Salemink E, Ridderinkhof KR. Cognitive bias modification and cognitive control training in addiction and related psychopathology. *Clin Psychol Sci*. 2013;**1**(2):192–212. doi: 10.1177/2167702612466547.

5. Abolghasemi A, Alah Gholilo K, Narimani M, Zahed A. [Emotion regulation strategies in stbstance abusers with high and low reactivity]. *J Guilan Univ Med Sci*. 2011;**20**(77):15–22. Persian.

6. Ahmadi G, Sohrabi F, Borjali A, Ghaderi M, Mohseni M. [Effectiveness of emotion regulation training on mindfulness and craving in soldiers with opioid use disorder]. *J Mil Psychol*. 2015;**6**(22):5–21. Persian.

7. Tice DM, Bratslavsky E. Giving in to feel good: The place of emotion regulation in the context of general self-control. *Psychol Inq*. 2000;**11**(3):149–59. doi: 10.1207/s15327965pli1103_03.

8. Leahy RL, Tirch D, Napolitano LA. *Emotion regulation in psychotherapy: A practitioner's guide*. Guilford Press; 2011.

9. Garnefski N, Kraaij V. Cognitive emotion regulation questionnaire – development of a short 18-item version (CERQ-short). *Pers Individ Dif*. 2006;**41**(6):1045–53. doi: 10.1016/j.paid.2006.04.010.

10. Bahrami B, Bahrami A, Mashhadi A, Karshki H. [The role of cognitive emotion regulation strategies in the life quality of the canser patients]. *Med J Mashhad Univ Med Sci*. 2015;**58**(2):96–105. Persian.

11. Gasempour A, Fahimi S, Abolghasemi A, Amiri A, Akbari E, Fakhari A. [Recognition of facial expression of emotion in patients with depression and normal people]. *Yafteh*. 2012;**14**(1):91–8. Persian.

12. Kemmis LK, Wanigaratne S, Ehntholt KA. Emotional processing in individuals with substance use disorder and posttraumatic stress disorder. *Int J Ment Health Addict*. 2017;**15**(4):900–18. doi: 10.1007/s11469-016-9727-6. [PubMed: 28798555]. [PubMed Central: PMC5529498].

13. Besharat MA. Reliability and factorial validity of a Farsi version of the 20-item Toronto Alexithymia Scale with a sample of Iranian students. *Psychol Rep*. 2007;**101**(1):209–20. doi: 10.2466/pr0.101.1.209-220. [PubMed: 17958129].

14. Altınöz AE, Aslan S, Uğurlu M, Özdel K, Sargın AE, Türkçapar MH. Measuring the beliefs on alcohol craving by using craving beliefs questionnaire: Preliminary results of its psychometric properties in a Turkish sample. *J Subst Use*. 2016;**21**(5):455–9. doi: 10.3109/14659891.2015.1056852.

15. Rahmanian M, Mirjafari A, Hasani J. [The relationship between craving and attentional bias in opioid dependent, relapsed and abstinent individuals]. *Iran J Psychiatry Clin Psychol*. 2006;**12**(3):216–22. Persian.

16. Verdejo-Garcia A, Bechara A, Recknor EC, Perez-Garcia M. Executive dysfunction in substance dependent individuals during drug use and abstinence: An examination of the behavioral, cognitive and emotional correlates of addiction. *J Int Neuropsychol Soc*. 2006;**12**(3):405–15. doi: 10.1017/S1355617706060486. [PubMed: 16903133].

17. Weiss NH, Tull MT, Viana AG, Anestis MD, Gratz KL. Impulsive behaviors as an emotion regulation strategy: Examining associations between PTSD, emotion dysregulation, and impulsive behaviors among substance dependent inpatients. *J Anxiety Disord*. 2012;**26**(3):453–8. doi: 10.1016/j.janxdis.2012.01.007. [PubMed: 22366447]. [PubMed Central: PMC3305816].

18. Marich J. EMDR in the addiction continuing care process case study of a cross-addicted female's treatment and recovery. *J EMDR Pract Res*. 2009;**3**(2):98–106. doi: 10.1891/1933-3196.3.2.98.

19. Kohler CG, Turner T, Stolar NM, Bilker WB, Brensinger CM, Gur RE, et al. Differences in facial expressions of four universal emotions. *Psychiatry Res*. 2004;**128**(3):235–44. doi: 10.1016/j.psychres.2004.07.003. [PubMed: 15541780].

20. Jhung K, Namkoong K, Kang JI, Ha RY, An SK, Kim CH, et al. Perception bias of disgust in ambiguous facial expressions in obsessive-compulsive disorder. *Psychiatry Res*. 2010;**178**(1):126–31. doi: 10.1016/j.psychres.2009.11.023. [PubMed: 20452054].

21. Miller MA, Bershad AK, de Wit H. Drug effects on responses to emotional facial expressions: Recent findings. *Behav Pharmacol*. 2015;**26**(6):571–9. doi: 10.1097/FBP.0000000000000164. [PubMed: 26226144]. [PubMed Central: PMC4905685].

22. Bonnet A, Brejard V, Pedinielli JL. Emotional dispositions and substance use: Mediating effect of alexithymia. *Psychol Rep*. 2013;**112**(1):289–302. doi: 10.2466/18.09.20.PR0.112.1.289-302. [PubMed: 23654043].

23. Amini-Lari M, Alammehrjerdi Z, Ameli F, Joulaei H, Daneshmand R, Faramarzi H, et al. Cognitive-behavioral therapy for opiate users in methadone treatment: A multicenter randomized controlled Trial. *Iran J Psychiatry Behav Sci*. 2017;**11**(2). e9302. doi: 10.5812/ijpbs.9302.

24. Alammehrjerdi Z. Brief cognitive-behavioural therapy for methamphetamine use among methadone-maintained women: A multicentre randomised controlled trial. *J Addict Res Ther*. 2016;**7**(4). doi: 10.4172/2155-6105.1000294.

25. Moradi A, Alammehrjerdi Z, Daneshmand R, Amini-Lari M, Zarghami M, Dolan K. HIV responses in Arab states on the southern Persian Gulf border: The first review. *Iran J Psychiatry Behav Sci*. 2016;**10**(3). e5392. doi: 10.17795/ijpbs-5392. [PubMed: 27822284]. [PubMed Central: PMC5097829].