



The Effectiveness of Cognitive Behavior Therapy on Alexithymia, Emotion Regulation, and Psychological Capital of Male Substance Abusers in Kerman

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Abstract

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Background: Substance dependence is a maladaptive pattern that leads to clinically significant degradation and is manifested through a set of cognitive, behavioral, and physiological symptoms. The aim of this study was to evaluate the effectiveness of cognitive behavioral therapy (CBT) on alexithymia, emotional regulation and psychological capital of male substance abusers, under the auspices of addiction treatment centers.

Methods: This randomized clinical trial was conducted from June to September 2021 in Kerman, Iran using a pretest, post-test design with a control group. A single therapy center was randomly selected via multi-stage cluster sampling from several substance abuse treatment centers using agonists for treatment. Then 50 people were randomly selected and allocated to experimental and control groups. The research instruments were questionnaires for alexithymia, emotional regulation, and psychological capital. After the pretest phase, the experimental group underwent 10 sessions of CBT. In the next step, the post-test was conducted and after 6 weeks the follow-up test was performed on the groups. The control group did not receive the intervention. Finally, the data obtained from 40 participants were analyzed using the t-test in SPSS-25 software.

Results: The findings indicated that the intervention in the post-test phase significantly reduced alexithymia ($P=0.001$), increased emotion regulation ($P=0.001$) and increased psychological capital ($P=0.003$). Also, in the follow-up phase, the results show a significant decrease in alexithymia ($P=0.002$), increase in emotion regulation ($P=0.001$) and increase in psychological capital ($P=0.002$).

Conclusion: CBT can improve alexithymia, emotional regulation and psychological capital of substance abusers and can be used in addiction treatment centers.

Keywords: Addiction, Cognitive behavior therapy, Alexithymia, Emotion regulation, Psychological capital



Background

Substance dependence is a maladaptive pattern of consumption that causes significant clinical degradation through a set of cognitive, behavioral, and physiological symptoms (1).

The annual reports of the World Health Organization show that Iran is one of the countries with the highest prevalence of drug and psychotropic addiction in the world and the prevalence is about 5.5% (2). Also, according to the report of the National Institute of Mental Health, the prevalence of substance abuse disorder in the general population is 35.3% (3). Studies showed that substance abuse is affected by biological, psychological, and social factors (4).

Alexithymia is one of the effective factors in substance use (5). Failure to express emotion (due to a defect in the ability to process and regulate emotions) or conscious inhibition of emotional expression is called alexithymia (6). Individuals with a high level of alexithymia have difficulty identifying feelings (DIF), difficulty describing feelings (DDF) and externally oriented thinking (EOT) (7). Such persons are more prone to the use of alcohol, drug, stimulants, and other compulsive behaviors than others. They usually exhibit these behaviors to avoid experiencing an inner vacuum (8).

Emotion Dysregulation is one of the criteria for mental disorders in the DSM5 (9). Studies have shown that emotion dysregulation is effective in the development of addiction (10). Emotional dysregulation is defined as a maladaptive method of responding to emotions that includes unacceptable responses, difficulty in controlling impulses in the context of emotional distress, and deficits in the functional use of emotions as information (11). People with substance abuse, use drugs to reduce undesirable emotional states (12). On the other hand, emotion regulation includes skills related to emotion awareness and evaluation, emotion regulation, and adaptive use of emotions (13). By increasing emotional regulation, people become more able to understand the desires of others and control the unwanted pressures of others to use drugs and better manage their emotions, and as a result, show more resistance to substance use (14).

According to researchers, the reduction of

psychological capital also plays an important role in the development of addiction (15). Psychological capital is a positive psychological state and a realistic and flexible approach to life that consists of four structures: resilience, self-efficacy, hope, and optimism (16). Psychological capital is considered a higher-level structure. Therefore, it is expected that the whole structure will have a greater impact on performance than each of its constituent variables (17).

According to the United Nations Office on Drugs and Crime (UNODC), prevention and treatment of substance use disorders is not available in many parts of the world, with only one in seven persons having access to treatment each year (18). One of the effective approaches in the treatment and prevention of addiction is the CBT approach, which was invented by Ellis and Beck. Based on CBT, the presence of irrational thoughts plays an important role in addiction and failure in the treatment of the addicted person, and this factor causes resistance in treatment and recurrence of the disease (19). CBT is an intervention that brings about emotional and behavioral change in a person by learning problem-solving skills and recognizing thoughts in a problem-oriented way (20).

Research has shown that CBT could be effective on improving alexithymia (21), emotional regulation (22, 23) and psychological capital (24). But in another study, the CBT did not show an effect on alexithymia (25). Identifying an appropriate treatment approach to improve the factors affecting substance abuse such as alexithymia, emotion regulation and psychological capital is necessary. Therefore, this study was conducted with the aim of determining the effectiveness of CBT on alexithymia, emotional regulation and psychological capital of men who abuse drugs.

Methods

This randomized clinical trial consisted of pretest and post-test phases and had a control group. The study was conducted in 2021 in Kerman, Iran with a population consisting of all male substance abusers (aged 18-50 years) visiting addiction treatment centers. This study was carried out with the code of ethics of IR.IAU. KERMAN. REC. 1400.012 from the

Research in Ethics Committee of the of Islamic Azad University, Kerman branch.

The present study had five independent variables including: age, gender, educational status, marital status and CBT and three dependent variables including: alexithymia, emotion regulation and psychological capital. Cohen's analysis was used to determine the sample size (26). Based on a power of 0.8, effect size of 0.50 and error of 5%, the minimum sample size was 20 people in each group. Because of the possibility of a number of participants withdrawing from the study, 25 people per group were enrolled.

The inclusion criteria were being a substance abuser according to the DSM5 criteria, absence of severe mental disorders, having a minimum education of primary school level, and willingness to participate in the study. The exclusion criteria were absence of more than two sessions and unwillingness to continue participating in the study.

To conduct the study, first a list of substance abuse treatment centers that used agonists for treatment was prepared. Then, using a multi-stage cluster method, initially one area was randomly selected from among 5 urban areas. Then, among the centers of that area, one center was randomly selected for this study.

Individuals treated by this center were evaluated by the researcher in terms of the inclusion and exclusion criteria. Participants were properly informed about the research plan and then invited to cooperate. Then from the eligible people, 50 participants were randomly selected by a person unaware of the objective of the study and by using a table of random numbers. Informed written consent was acquired from all participants. Then, using a table of random numbers, the selector placed the participants in two experimental and control groups.

The research instruments were three questionnaires for alexithymia, emotional regulation, and psychological capital, which have been listed below.

The Toronto Alexithymia scale (TAS-20) was developed by Bagby et al. to measure alexithymia indicators. It is a self-reported scale consisting of 20 items. Each item is scored via a five-point Likert scale. The score ranges from 20 to 100. Higher scores indicate the presence

of more alexithymia characteristics and lower scores indicate a more favorable situation. Alexithymia has three subscales consisting of "difficulty identifying feelings (DIF)", "difficulty describing feelings (DDF)", and "externally oriented thinking (EOT)". The psychometric indicators of this scale have been verified and its validity and reliability has been confirmed in different populations (8, 27, 28). In the Persian version of this scale, Cronbach's alpha coefficients for the total score of the scale were 0.85 and the test-retest reliability of the questionnaire sub-scales completed on two occasions with an interval of four weeks was from 0.70 to 0.77 (29).

The Cognitive Emotion Regulation Questionnaire (CERQ) is a self-reported questionnaire developed in 1999 by Garnowski. It measures specific cognitive emotion regulation strategies in target groups. The questionnaire relies on theoretical and empirical foundations and is the first questionnaire used in response to the experience of threatening or stressful life events. The CERQ is a 36-item questionnaire with a score of 36 to 180. Higher scores indicate a more favorable situation. The Cronbach's alpha of this questionnaire was 0.87 to 0.93. In Farsi language, the validity and reliability of this scale based on concurrent validity and Cronbach's alpha have been reported as 0.81 and 0.85, respectively (30).

Psychological capital (PsyCap) was defined by Luthans and is measured with the PCQ-24 questionnaire. The PCQ-24 comprises four subscales with equal weight: hope, optimism, self-efficacy, and resilience. Each subscale consists of six items with responses on a six-point Likert scale ranging from one (strongly disagree) to six (strongly agree). The total score of the PCQ-24 questionnaire ranges from 24 to 144. Higher scores indicate a more favorable situation. Luthans et al.'s study showed proper internal consistency based on Cronbach's alpha for the respective subscales (hope: 0.72, 0.75, 0.80, 0.76; self-efficacy: 0.75, 0.84, 0.85, 0.75; optimism: 0.74, 0.69, 0.76, 0.79; and resilience: 0.71, 0.71, 0.66, 0.72) which was reported in four studied samples (31). In Iran, the content validity and its structures were confirmed in the research of Hashemi Nosratabad, Babapour Khairuddin, and Bahadori Khosroshahi and the internal reliability of this questionnaire was 0.85 based on Cronbach's alpha (32).

After performing a pretest on the groups, the experimental group underwent CBT for 10 sessions of 1.5 hours each per week. The control group did not receive any intervention. Table 1 summarizes the protocol and content of CBT

session. After the experimenter's group training was over, the post-test was conducted and after six weeks, the follow-up was performed. After the treatment sessions started, five participants withdrew from each group. (Figure 1).

Table 1. Contents of Carol's CBT protocol (33) by session

Session	Content
1	Getting important history and communication, motivating, introducing functional analysis, agreeing on treatment goals and treatment contracts, providing a rationale for out-of-session assignments.
2	Understand desire, describe desire, identify motivators, avoid signs of desire
3	Identify and prioritize goals, identify and deal with substance-related thoughts
4	Learning and practicing substance abstinence skills, examining the difference between passive, aggressive and assertive response
5	Identify seemingly irrelevant decisions and their relationship to risky situations, identify examples of seemingly irrelevant decisions, practice healthy decision making
6	Teaching communication skills and emotion regulation and coping skills
7	Introduce the basic steps of problem solving, practice on problem solving skills within the session
8	Review and apply problem-solving skills to psychological, social issues that hinder treatment. Design an objective support program to identify psychosocial issues, review, and support patient efforts to implement the program
9	Motivate to change risky behaviors, set behavioral change goals, solve problems to reduce risk barriers, provide specific guidelines for reducing risk
10	Review the treatment plan and goals, provide feedback on the progression of the disease from the therapist's point of view, receive feedback from the patient on the successful and unsuccessful aspects of the treatment

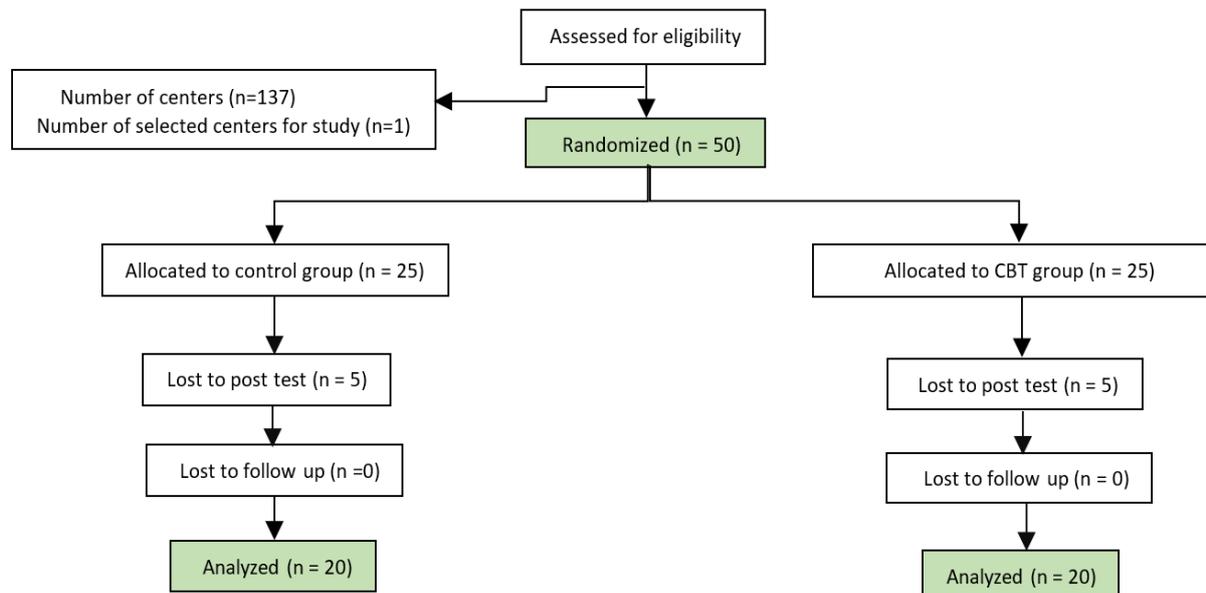


Figure 1. The consort flow diagram of study

Finally, the scores of 40 participants were analyzed through SPSS-25 software and using paired and independent t-tests.

Results

The demographic characteristics of the participants in the two experimental and control groups including: age, education

level and marital status, are presented in Table 2.

The mean and standard deviation (SD) of alexithymia, emotional regulation, and psychological capital of both experimental and control groups in the pretest, post-test, and follow-up phases and their comparisons are presented in Table 3.

Table 2. Demographics of participants in experimental and control groups

Variable		Control Group Mean ± SD	CBT Group Mean ± SD	t	P
Age		38.10±7.5	37.9±8.6	1.16	0.09
Education	Level	n (%)	n (%)	χ²	p
	Elementary	14(70)	14(70)		
	Middle school	2(10)	4(20)	1.82	0.12
	High school	2(10)	1(5)		
Marital	Status	n (%)	n (%)	χ²	p
	Married	4(20)	5(25)		
	Single	12(60)	14(70)	0.88	0.37
	Divorced	4(20)	1(5)		

Table 3. Descriptive statistics of variables and t-test in pre-test, post-test and follow-up phases in both groups

Groups	Number of participants	Variable	Pre-test Mean ± SD	Post-test Mean ± SD	p-value of comparing pre-test with post test *	Follow-up Mean ± SD	p-value of comparing pre- test with follow- up test *
Intervention (CBT)	20	Alexithymia	41.15 ± 7.92	37.50 ± 6.50	0.002	38.72 ± 6.42	0.002
		Emotional regulation	79.45 ± 12.69	90.05 ± 13.00	0.001	84.65 ± 13.10	0.003
		Psychological capital	22.95 ± 4.67	32.00 ± 5.61	0.001	28.55 ± 5.36	0.003
Control	20	Alexithymia	40.30 ± 7.00	39.24 ± 6.52	0.152	40.64 ± 7.19	0.170
		Emotional regulation	78.10 ± 15.76	74.55 ± 17.11	0.094	76.10 ± 15.22	0.142
		Psychological capital	22.05 ± 6.94	21.95 ± 5.96	0.151	22.77 ± 5.88	0.194
p-value of comparing Alexithymia between CBT and control **			0.54	0.001		0.002	
p-value of comparing Emotional regulation between CBT and control **			0.56	0.001		0.001	
p-value of comparing psychological capital between CBT and control **			0.54	0.003		0.002	

* Paired t-test was used

** Independent t-test was used

Independent and paired t-tests were used to analyze the data of this research. One of the assumptions of this test is the assumption of homogeneity of variance, which Levine's test was used to check. The results of this test showed that the test statistic value obtained for the variables of this research in the pre-test, post-test and follow-up stages was $P > 0.05$, which indicates that the variances of the variables of the intervention and control groups are homogeneous.

Table 3 also shows the comparison of the average of the variables in intervention group with the control group in different stages of the trial using independent t-test.

The results of the independent t-test in the pre-test stage for alexithymia ($p=0.54$); emotional regulation ($p=0.56$) and psychological capital ($p=0.54$), which showed that there was no significant difference between the intervention and control groups in the research variables before the intervention started.

In the post-test stage, the results of the t-test

showed that in the variables of alexithymia ($p=0.001$), emotion regulation ($p=0.001$) and psychological capital ($p=0.003$) were significantly different between the intervention and control groups. Hence, the findings showed that the intervention significantly reduced alexithymia and increased emotional regulation and psychological capital.

In the follow-up phase, the results of the t-test showed that alexithymia ($P=0.002$), emotion regulation ($P=0.001$), and psychological capital ($P=0.002$), were significantly different between the intervention and control groups. Hence, the results showed that in the follow-up phase, the effectiveness of the intervention was sustained and it still significantly reduced alexithymia and increased emotional regulation and psychological capital.

Discussion

The results showed that the CBT is significantly effective in reducing the scores of alexithymia. This result is consistent with the findings of Morie et al.'s study on 73 people

among cocaine-dependent methadone-maintained individuals in Connecticut, USA (21) and Sedighrad et al. study on 30 patients with depression in Ahvaz, Iran (34). But it was not consistent with the study of Rufer et al., which was conducted on 40 obsessive compulsive disorder patients admitted to a hospital in Hamburg, Germany (25). To elaborate the results of the present study on the effectiveness of CBT on alexithymia in substance abusers, it can be said that some areas of the brain, including the prefrontal cortex, cingulate cortex and limbic systems, play a crucial role in emotion processing. Studies examining the structure and function of the brain by medical imaging have proven the effectiveness of CBT in improving the function of these areas. The findings showed that CBT increases the ability to process facial emotion expression. This factor improves social relationships and negative mood problems (21).

Another result of this study indicated that CBT significantly increased the scores of emotional regulation of substance abusers in post-test. This result is consistent with the results of Berking et al.'s study on 289 hospitalized patients and 249 people without clinical problems as a control group in the United States (35) and Tawafi et al.'s study on 60 overweight individuals referred to medical centers in Tehran, Iran. (23). To explain the results of the present study on the effectiveness of CBT on emotion regulation, it can be said that in this approach, substance abusers regulate their emotions by learning how to reduce emotion and express their inner emotions. On the other hand, by learning and implementing behavioral techniques, it helps to reduce the absorption of negative emotions and increase the effort to reduce confusion, and this leads to improved emotion regulation and increased distress tolerance. In other words, people undergoing CBT, as faced with negative emotions, have the skills to deal with these emotions and can get rid of emotional turmoil by understanding the situation and applying the guidelines.

The results of this study also showed that CBT is significantly effective in increasing the scores of psychological capitals. This result is consistent with the results of Nasiri Takami et al.'s study, which was conducted on 51 teenagers aged 15 to 17 with depressive symptoms referred to psychological counseling

centers and psychiatric clinics in Sari, Iran (24). To elaborate how CBT affects positive psychological capital, it can be said that the main purpose of CBT is to control people's negative emotions and empower them to deal with life events by changing and modifying their way of thinking and behaving (36). In fact, by changing the thoughts of substance abusers, their feelings and behaviors will also change. This type of therapy creates a stronger sense of control by increasing cognitive-behavioral skills such as problem solving, detecting and identifying distorted thoughts, and interpreting events from newer dimensions, and also puts people consciously and active in a position that they feel that they can take control of uncontrollable affairs. Substance abusers also learn to pay attention to the positive aspects of an event instead of the negative aspects, and not to make predictions without sufficient evidence and reason, and to reinforce their vision of the future with a positive realism.

Limitations of this study include the low level of education of most participants and implementation of this research only on men with substance abuse; therefore, care should be taken while generalizing it to other samples (other age groups and women). In this study, collecting information was based on a self-report scale and these reports could have been false due to lack of knowledge, prejudices while responding or motivational factors, and inability to control all intervening variables. It is, therefore possible that subjects were influenced by conditions that were out of the control of the researchers.

According to the results of this study, it is suggested to use the CBT approach in addiction treatment centers. It is also suggested that other factors affecting substance abuse, such as personality disorders, should be investigated in future studies.

Conclusion

The findings of this study indicate that CBT mitigates alexithymia while enhancing emotion regulation and psychological capital in substance abusers, and these changes remained even 6 weeks after the end of the trail.

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Conflict of interest

The Authors have no conflict of interests.

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