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Effect of anger management training based on cognitive-behavioral method on behavioral activation system and behavioral inhibition system

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Abstract

Introduction: Addiction is one of the main human problems in the recent years and one of the most complex humanistic phenomena. So, the present study aimed to assess the effect of anger management training based on cognitive-behavioral method on behavioral activation system and behavioral inhibition system.

Materials and Methods: In this research, cases included 30 persons (experimental group: 15, control group: 15) selected among 186 substance abusers who referred to the clinics of Lamard city in 2015-16. The experimental group trained anger management skill through in 12 ninety-minute sessions. The results analyzed by covariance test.

Results: The results of single variable covariance analysis indicated that there is significant difference between two groups in brain-behavioral systems ($P=0.001$) and anger management training can enhance the function of brain-behavioral systems.

Conclusion: The results showed that anger management training can enhance function of brain-behavioral systems also it leads to reduced activation system and induced inhibition system.

Keywords: Anger management, Brain-behavioral systems, Cognitive-behavioral

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Introduction

Addiction is one of the most serious human problems in recent years, and it is one of the most complex human phenomena that destroys the foundations of human society, and its prevention requires the application of multiple theories in various scientific fields and diverse techniques (1). Narcotics are chemical elements that change a person's mood and behavior after consumption

(2). Clinical findings have shown that various biological, psychological, and social factors affect the formation of substance abuse disorder (3). In addition, the progress of studies indicates the existence of physiological factors in the occurrence of clinical problems in a person addicted to substance abuse (4).

Today, the entry of neuroscience into the field of personality is visible. The theory is one of the

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most effective biological theories in the field of personality, which has led to numerous neurophysiological studies (5). Geoffrey Gray's neuropsychological theory of personality, known as Reinforcement Sensitivity Theory (RST), has been developing since its inception and has made significant progress in the last three decades (6). This theory includes three brain/behavioral systems as follows, which are:

1. The Behavioral Activation System or tendency motivational system (BAS) includes areas of the brain that affect a person's sensitivity to rewards and makes a person sensitive to potential rewards and motivated to seek these rewards.

2. Behavioral Inhibition System or Stop Incentive System (BIS) includes areas of the brain that affect a person's sensitivity to punishment and make a person sensitive to potential punishment and avoid it. This system leads to anxiety, inhibition, and reactive avoidance in response to punishment signs and new stimuli and is known as the anxiety system.

3. The Fight/Flight/Freeze System (FFFS) this system, which is called the fight/flight/freeze system in the revised version of Gray and McNaughton's theory (2000), in response to conditioned and unconditioned unpleasant stimuli, escape behavior, and it activates avoidance, and the emotion of fear is attributed to it (7). The response of this system in situations where fighting or flight is impossible will be immobility (freezing) (8). Several studies have been conducted on the relationship between substance abuse and emotions, and brain reward systems show that substance use is often related to brain reward systems and emotions. Emotions are mental, biological, purposeful, and social phenomena. Natural phenomena that occur in different people under the same conditions and call for specific physiological responses (9), one of the emotions that play an essential and influential role in the lives of all people is the emotion of anger. Although anger is a type of emotion that often appears as a result of a person's reaction to the inappropriate behavior of others (10), many experimental pieces of evidence have shown the destructive effects of anger in human relationships (11), and it is also known that anger and impulsivity are one of the It is the characteristics of types of addiction (12). Anger

and its control are one of the most serious areas of substance abuse control and relapse prevention (13). In this study, the cognitive-behavioral method of Noaco was used to teach anger management skills. In Noaco's cognitive-behavioral approach, reducing aggression is based on cognitive restructuring and anger control, which follows the therapeutic model of "stress inoculation". This therapeutic approach has three interconnected stages or steps: 1) cognitive preparation, 2) skill acquisition and 3) teaching how to apply what has been learned (14).

Considering that the number of substance abusers in Iran and the world is increasing, and addiction is considered one of the most severe areas of social damage in Iran and the world, as well as numerous researches so far on the role of lack of life skills, system bias Rewards, and punishments, have been emphasized in the brain of substance abusers. Therefore, this research investigated the effectiveness of anger management skill training in a cognitive-behavioral way on the brain-behavioral systems of substance abusers.

Materials and Methods

The present research is an experimental method using a pre-test-post-test plan with a control group. The sample of the present study is 30 substance abusers undergoing treatment in addiction treatment centers in Lamard city with a history of withdrawal at least once and use of at least two years. First, the type of traditional narcotics used, education from illiterate to doctorate, and male gender were selected from among all substance abusers referred to addiction treatment clinics in Lamard city in 2015-2016. Then the participants were randomly divided into two test groups (15 people) and a control group (15 people).

Research instruments

A) *Jackson's Reinforcement Sensitivity Questionnaire (r-RST)*: Jackson investigated the psychological characteristics of the revised Jackson Reinforcement Sensitivity Scale (r-RST). This questionnaire includes three brain-behavioral systems, which are sub-scales of behavioral activation system (BAS), inhibition system (BIS), and fight, flight, and freeze system (r-FFF). The third system includes the three

components of fight, flight, and freezing, which form Jackson's five factors together with the activation and inhibition systems (15). The statements of this questionnaire are scored on a five-point Likert scale. The structural validity of five factors: Behavioral Activation System (BAS), Behavioral Inhibition System (BIS), Fight, Flight, and Freezing (FFFS) has been approved, and Cronbach's alpha method was used to measure the reliability of this test, and its overall Cronbach's alpha coefficient was reported as 0.70. Also, the reliability of its subscales for the behavioral activation system is 0.83, the behavioral inhibition system is 0.76, and the fight-avoidance and freezing system is 0.74 (war component, 0.78, avoidance component, 0.74, and freezing component (0.70) reported. In Iran, Hassani et al. standardized this questionnaire. In this research, the validity of the questionnaire was investigated based on internal consistency, item set correlations, and retesting methods. Also, the validity of the scale was examined through the method of factor analysis, the correlation between sub-scales, and criterion validity. The range of Cronbach's alpha (0.72 to 0.88), test-retest coefficients (0.64 to 0.78), and item set correlations (0.28 to 0.68) indicate the reasonable validity of the Persian version of Jackson's five-factor questionnaire. The exploratory and confirmatory analysis supported the primary five-factor model of the questionnaire (16).

B) Noaco Inventory: This questionnaire, created by Noaco in 1986, contains 25 items that measure anger, aggression, and resentment. The components of the questionnaire include aggressive behavior, aggressive thinking, and aggressive feeling to score this 25-item scale for each of the four options (never, rarely, sometimes, and always), with values of 0, 1, 2, and 3, respectively. Opinions have been asked. This method is reversed except for Article 18, which has a negative factor load. Therefore, people who score higher than average on this scale will have high aggression, and those who score lower than average will have low aggression (17). The validity and reliability of Noaco's Anger Questionnaire were conducted in Iran by Mukhtar Malek Pour in 2013. In this research, 100 students of Isfahan University were selected by a simple random sampling method, and Noaco's anger questionnaire was

administered to them. The data was analyzed, and the test validity was investigated using three methods of correlation of test scores with the Buss and Perry aggression test, content validity method, and questionnaire factor analysis method. Also, the reliability of the test was obtained using Cronbach's alpha and retest methods. The results showed that the reliability of this test with the alpha method is equal to 0.86, the retest method is equal to .73, and the validity of the correlation test with the Buss and Perry test is equal to 0.78 (18).

Intervention (in the form of cognitive-behavioral anger management training sessions) for the test group (15 people) according to the instructions of the anger management training package for psychologists, written by Riley Washopshire) 2 days a week for 12 sessions, and each session lasts 90 minutes. It was implemented, and the content of this method is summarized below:

In the first and second sessions: the general goals, rules, conceptual framework, and logic of the treatment method and anger management were presented; and most of the time of this session was spent on providing conceptual information and making sure that the members understood it, analyzing the anger meter and identifying events and signs, which indicate the intensity of anger. The third and fourth sessions: learning cognitive-behavioral strategies of anger control, learning the cycle of aggression, and the method of gradual muscle relaxation.

In the fifth and sixth sessions: A-B-C-D model training and thought-stopping skill training (cognitive reconstruction), we reviewed and summarized the main concepts of anger management (such as anger meter, anger symptoms, aggression cycle, and cognitive reconstruction) that have been presented so far, and people We further encouraged the group to complete the anger management program and balance immediate and preventive cognitive-behavioral strategies. 7th and eighth session: According to the instructions of the educational package, the issue of assertiveness, aggression, passivity, and conflict resolution model was discussed. 9th and 10th sessions: answers to the questions of the therapists. The impact of past interactions on their current behavior, thoughts, feelings, and characteristics. The 11th and 12th

sessions: dealing with the main concepts of anger management (such as anger meter, anger symptoms, aggression cycle, and cognitive restructuring) and assertiveness skills, an overview of the anger control program, and scoring the usefulness of the course was done.

Results

The results of single-variable covariance analysis showed that between the brain-behavioral systems of the test group that were trained in anger management skills and the control group that was not trained, in terms of the amount of brain-behavioral systems according to F equals 101.185 and P=0.001.

There is a significant difference; and teaching anger management skills increases the amount of brain-behavioral systems. Also, the analysis of covariance showed a significant

difference between the test group that received training on anger management skills and the control group that did not receive any training in the behavioral activation system (BAS) according to the f value equal to 30.637 and P=0.001. There is; In other words, anger management skill training reduces the behavioral activation system (BAS) of the experimental group compared to the control group. Furthermore, finally, there is a significant difference between the experimental group that received anger management skills and the control group that did not receive any training in terms of the behavioral inhibition system (BIS) according to the f value equal to 59.940 and P=0.001. In other words, the anger management skill increases the behavioral inhibition system (BIS) of the experimental group compared to the control group.

Table 1. The mean and standard deviation of the brain-behavioral systems score in the pre-test and post-test stages

Stage	Variable	Experimental (M ± SD)	Control (M ± SD)
Pre-test	Brain-behavioral systems	78.20 ± 5.26	78.26 ± 5.54
Pre-test	Behavioral activation system	14.46 ± 2.38	15.33 ± 2.84
Pre-test	Fight-flight-freezing system	15.00 ± 2.92	14.80 ± 2.95
Post-test	Brain-behavioral systems	95.80 ± 3.93	79.46 ± 5.38
Post-test	Behavioral activation system	12.20 ± 1.52	15.93 ± 3.69
Post-test	Fight-flight-freezing system	24.66 ± 3.71	16.33 ± 1.91

Discussion

Based on this research, training in anger management skills increases the amount of brain-behavioral systems. This result is based on research entitled comparing the activity of brain-behavioral systems of methamphetamine addicts with ordinary people, based on the increase in the amount of brain-behavioral systems. As a result of training, it is the same (19), and anger management skills have reduced the behavioral activation system. This result is in agreement with the research of Hosseini (19), Franken (20), Hashemi (21), Fletchera and Parker (22), and Moradi et al. (23) is consistent. In explaining these findings, it can be said that extreme levels of the behavioral activation system tend to be related to pathological symptoms. In other words, a high behavioral activation system is related to a specific type of pathology. Therefore, people who

are at the end pole of the behavioral activation system are more likely to develop pathological symptoms, and by training anger management skills, we can reduce the activation system and the damage caused by it. In this regard, if experts and researchers teach related skills to substance abusers, they can provide the basis for strengthening and continuity of the desired therapeutic changes.

In this research, anger management skills increased the behavioral inhibition system of the test group compared to the control, which is consistent with Hosseini et al. (19), and Kim et al. (24) is aligned. Substance abuse and substance dependence, as significant challenges of the contemporary world, include various ways of consumption and different classes of consumers. Anger and its control are one of the most serious areas of substance use control. In addition to

general reactions, emotions also provoke some specific behavioral tendencies. Among the various reactions, the aggressive, emotional reaction is noteworthy. A person shows complex responses when faced with stressful situations and external pressure. Among these reactions are anger and war. As a result of anger management training, a person learns how to control anger and evaluate others positively (25).

Conclusion

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The results showed that the training of anger management skills affects the amount of brain-behavioral systems. Training in anger management skills increases the amount of brain-behavioral systems and behavioral inhibition system; also decreases the behavioral activation system in the experimental group.

As a result of anger management training, a person learns how to control his anger and evaluate others positively.