



Evaluation of The Neurofeedback Method Effectiveness On Craving in Narcotic Drugs-Dependent Patients

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Abstract: *The goal of this research was to study and determine effectiveness of the Neurofeedback therapeutic method on amount of Craving in narcotic drugs-dependent patients and research method was quasi-experimental. 20 narcotic drugs-dependent male patients with 40-20 year-old age range and referring to the 10 centers and addiction rehabilitation clinic of Bojnord city with the number of 80 people that 40 people were selected randomly and after the implementation of Franken's Craving inventory were placed in two experiment and control group by the random assignment and makeup. Patients in the experimental group received 25 sessions of Neurofeedback treatment (for 6 weeks, 4 hours per week) and patients in the control group did not receive specific treatment, and patients of two groups was measured by testing Franken's Craving at the end. The results of analysis of covariance showed that the experimental group was decreased variable of Craving in narcotic drugs than control group at the end of period. Therefore, this Neurofeedback therapeutic method can be effectiveness on decreasing amount of Craving in narcotic opium drugs-dependent patients.*

Keywords: *Neurofeedback, Craving, narcotic drugs*

INTRODUCTION

Nowadays, substance abuse is saddest tragedy and influences on biological, psychological and social aspects and life of many people. Long-term use of narcotic drugs does not have only adverse effects on economic and social status of people, but in all aspects of their family life has determinative role (Narimani, Hashemi, Mashynchy and Fotohi BONAB, 1388). Narcotic drugs addiction is recurrent and chronic mental illness and along with severe motivational disorders and loss of behavioral control (Dallas, David, Julie, 2010). According to fifth series diagnostic and Statistical guidance, existence of one of the cognitive, behavioral and physiological symptoms is an important feature of substance abuse disorders that people with significant problems associated with the abuse continue to use it. According to the diagnostic collection, substance abuse disorder has a fundamental change in brain circuits (especially those with large disparity) and these changes may remain after detoxification (Diagnostic and Statistical Manual of Mental Disorders, 2013). Craving is a penchant and resistant desire of drugs consumption, if it is not met, will have Psychological and physical sufferings, such as fatigue, anorexia, anxiety, insomnia, aggression, and depression (Adulutal et al, 2005). Also, voracity is very strong sense and urgent desiring to one thing, so that any possibility of focusing on something other than the asked subject is impossible (Hurmes & Rozben, 2010). However, working on improvement of drugs Craving of patients is one of the important steps in the treatment of substance dependent disorder. Studies have shown that neural - particular brain chemical mechanisms involved in Craving of substance dependent patients. One of the most important theories in this field is the theory of cascading blooms in

explaining the substance dependent disorder by Darwin and according to this theory, genetic abnormality makes to disruption of neural- chemical processes and this pulls drug-dependent patients toward hard helix of voracity and lust. In these patients with brain frequencies and followed by that specific chemical biological agent has been locked and people are not able to understand and feel strength under normal circumstances as healthy people have ability. These people only by substance consumption can get active locked chemical biological agent and get a feeling reinforced. This disorder named as reinforcement deficiency syndrome associated with abnormalities of alpha- Theta waves brain. There are the various theories on interpersonal factors, behavioral- psychological factors and biological - genetic factors in the etiology of drug-dependent disorder (Zakaryaie, 1382). In recent years in the field of etiology, neurological diseases are considered. Over the past 30 years, many scientific activities were performed so as to discover effective mind capacity in body and recognize effective and affective methods of mind and brain on body and it's performances such as relationship brain and mental (Lawrence , 2000). According to Hammond , Newton, Cook, Kalechstein, Duran, Monoroy, Ling & Leuchter (2003), Alper , Princhev, Kowalik, Rosenthal & Roy , the reason of many repetitive lutes of voracity in drug-dependent patients is abnormal consistence of neurology in brain . In treatment of necrotic drugs - dependent disorder, neurology studies on relationship between electroencephalography , brain Thalamocortical infrastructure mechanisms and individual psychological states showed that create favorable changes in rhythm and frequency brain waves, using neural therapy, can make the desired changes in neurological conditions (Serman, 1996) . Many studies on the efficiency and effectiveness of Neurofeedback training as one of these methods of neural therapy about the psychological damage are conducted (Hammond 2006, Lawrence 2002 & Newton et al. 2003). This method formed based on accepted theory regarding the mind - body relation; including training the mind to function better ways to experience physical, behavioral, cognitive and emotional and healthy states and increase the brain's ability to repair, modify and improve own with the natural method (demos, 2005). Abnormal rhythms and frequencies based on Quantitative electroencephm lography can convert to the normal rhythm, frequency, and following by abnormal psychological states to normal by training Neurofeedback (Ganklmm vojoha Neston, 2005). Studies (Alper et al. 1998, Serman 1996, our 2006 Lawrence 2002) evaluate the effectiveness of neurofeedback treatment approaches to improve the treatment of many disorders, including alcohol and drug dependent patients. The results show the efficiency and effectiveness of this approach in reducing the signs and symptoms of drug and alcohol dependence (Rostami et al., 1382). Studies by sebastian, Karch, Keeser, Hümmer, Paolini, & other (2015), demonstrated the effectiveness of neurofeedback training method on Craving for alcohol-dependent patients. Also, studies by Sokhadze, Stewart & Hollifield(2007), Scott, Kaiser, Othmer & Sideroff(2005), Frederick, Timmermann, Russell & Lubar(2004), Masterpasqua & Healey(2003) have shown favorable changes in the condition of patients were dependent on alcohol and drug.

Canterberry, Hanlon, Hartwell, Owens, LeMatty(2013) , examined The efficacy of neurofeedback treatment on self-regulation and to facilitate the Craving for nicotine-dependent smokers and showed that this therapy has been shown to reduce smoking. Raymond, Varney, Parkinson & Gruzelier(2005), reported higher amount of avoiding and leaving patients in studies of neurofeedback treatment compared to the placebo group. the results of Dehghani , Rostami, Rahimi Nejad and Akbar (1386 and 1388) in Iran indicate a favorable effectiveness of Neuro-feedback therapy-educational method on improving the mental health, pathological symptoms and brain function in narcotic drug-dependent patients . In addition, Jyrayy, Yaryary and Abdullahi (1394) in a study to evaluate the effectiveness of neurofeedback treatment on Craving and depression in patients undergoing narcotic drugs dependence with methadone showed the treatment method was effective. Qaderi and Gholizdeh (1394) in a study to evaluate neurofeedback on Craving showed efficiency of neurofeedback on drug abusers group. According to scientific valuable advances in the study of neurological and psychological, medical studies and research in the field of drug-related disorders were less due to costly and hard working population and the complexity of the situation. Most researches are in field of dependence on narcotic drugs abroad in the field of alcohol. Other fields especially Craving variable has less attention; most studied are case and limited. In particular, studies in Iran to investigate rarely this new method -neurofeedback. Most studies examine the approach that was methadone. This proven method of Neurological problems in substance dependence disorder and approving the application and effectiveness of

Neuropsychological interventions including neurofeedback, improve disorder , taking into account the limitations of studies on the application of this method of treatment and reduce Craving , the field for scholars and researchers is questionable. According to experts, therapy method includes neurofeedback method as an index method that uses two psychologies (conditioning stretch-oriented perspective or agent) and the field of neurology (brain function). It is appropriate to give the importance and special look by specialists in psychology, psychiatry, psychiatric and neurological areas as well. The question is whether can be this method used to improve the patients' Craving as separate method or in conjunction with other conventional methods such as medication? which method or approach has a higher effectiveness and efficiency? This study was sought as to whether teaching methods - neurofeedback treatment has been effective in the treatment of narcotic-drugs dependent patients?

2. Method

The research method was semi-experimental with pretest –posttest design and control group. Under studying population is composed of all Narcotic-drugs dependent male patients (Opium, heroin and opium sap) 20 to 40-year with academic between 11 to 16 classes referred to 10 centers and addiction treatment clinic of Bojnord city. The sample included 40 narcotic drugs -dependent patients was randomly selected from among patients who were available and first were randomly selected and were replaced for cloning in groups. The average and standard deviation of experimental group was 28.45 and table 1 shows a summary of characteristics of the sample group.

Table 1

Demographic characteristics of the subjects of experimental and control groups

| group | number | age | | Education (years) | |
|--------------|--------|--------------------|-------|--------------------|--------------|
| | | standard deviation | mean | standard deviation | mean |
| experimental | 20 | 6.9 | 28.45 | 1.63 | 14 |
| control | 20 | 6.4 | 28.05 | 1.68 | 13.70 |

2.2. Instruments

Franken et al's 14-item Craving inventory was used to collect data. The inventory has been designed to measure Craving amount and intensity in patients addicted to narcotic drugs. The 14-item questionnaire measure drug consumption desire and intention, propensity to consume and the fun and intensity of loss of control and Craving amount and intensity are measured by the three factors. According to studies about instrument , the reliability of this scale in opiates is respectively 89%, 79%, 4% and a Mftamyn abuse is respectively 0.7, 0.65, 0.81 (Heinz, Epstein, Schroeder, Singleton, Heishman, & Preston, 2006). In a study by Moses, Mousavi & Kaffi (1391) , the reliability of this test is 0.96 in crack, 0.90 in a Mftamynha, 0.94 in heroin.

2.3. Procedure and data analysis

40 subjects based on the scores measure Craving were matched in two groups in the pre-test level and one group was randomly chosen as the experimental group. By 20 of experimental group received only neurofeedback; also 20 patients in control group only received pharmaceutical treatment with placebo. Neurofeedback treatment period of

experimental group lasted 6 weeks (4 hours in every week), Patients of control group spent on the time the waiting list. Therapeutic program continued in two groups under the specialist supervision of addiction clinic centers.

Neurofeedback education was performed proven, common, therapeutic protocol with SMR sensor motor protocol in area Cz (located in the central bar area of the cerebral cortex and parietal alpha and theta in the area Pz, in fact parietal area of the cerebral cortex) - the segmentation model based on international model, Each for 20 minutes using neurofeedback device of Vilistus model. The Vilistus is device receives signals from three electrodes attached to the scalp and other parts of the cerebral cortex and ears, and transfer them to the computer software system.

Vilistus is hardware acts like amplifier electricity. As waves produced by the brain through electrodes attached to the person charged are weak and soft. The device amplifies it and transmits the electrical signal stronger and study able to computer. The incoming waves on neurofeedback software of computer; then become sinusoidal waveform, and was analyzed based on therapeutic protocol. Waves of initial assessment meeting are registration so that they are strengthened or suppressed based on therapeutic protocol. They are audio-video in area Cz Feedback provided. The thresholds of waves to be set so that they retain at 80 percent of the time bands suppressed to lower the threshold. They receive strengthen (Feedback). if the reference can keep at 90 percent of the time and the repetitive efforts, bands (wave) reinforced above the threshold, the threshold will change under the program so that it approaches optimum threshold approach (Wilson, Pepper and mouse and 2006). In the area Pz, Feedback was audio (relation). In this protocol, reference closes his eyes closed and listens to the only sound broadcast (Nosratabadi, 1386).

Three-axis on the assignments are theta, alpha and beta waves and an additional axis was set to control the delta, thresholds so that Alpha and Theta be at least 60 percent above the person threshold and Theta is 20% above threshold (Fahryvn et al. 1992). At the end of the period, reassessment the patient performed using a Craving questionnaire. The experimental and control groups results in the pre-test and post-test of were analyzed by using SPSS tool. Table 2 shows a summary of the descriptive statistics of variables under studying.

Table 2

Descriptive indicators of drugs Craving in the experimental and control groups

| Variable | Group | Pretest | Post-test |
|-----------------------------|--------------|----------------------------------|--------------------------------------------|
| | | Mean+/- standard deviation | Mean +/- standard deviation |
| Drugs Craving | | | |
| Stress symptoms | experimental | 7.25+/- 83.25 | 10.74+/- 29.6 |
| Sleep overall quality | Control | 6.79+/- 82.6 | 6.21+/- 83.4 |

As seen in table 2, the mean of drugs Craving scores in the experimental group in pre-test and post-test level, is respectively 29.6, 83.25 and in the control group is respectively 83.4, 82.6. univariate covariance (ANCOVA) was

used to evaluate difference of drugs Craving scores between the control and experimental groups and its results are presented in Table 3.

Assumptions of this test were investigated ago performing analysis of covariance. Shapiro Wilk ' s significant levels and Levene test was obtained for drugs Craving variable more than 0.05 ; So the assumptions of normality and homogeneity of variances is true. Other assumptions covariance analysis is the assumption that the regression lines for each group in the study must be identical. If the regression lines are heterogeneous, covariance analysis will not be appropriate analysis for the data. In this theory, drugs Craving post-test and pre-test as were considered as the dependent variable and a sub – variable. The homogeneity gradients will be established when equality prevails between the dependent variable and sub-variable in all operating levels (control and experimental groups). In this study, equality prevails between the dependent variable and sub-variable in all operating levels (control and experimental groups) ($p < 0.05$). In addition, there was the non-significant interaction between the dependent variable and sub-variable. Multivariate analysis of covariance used to analyze data and study assumptions, study, control pretest effect, and study whether the effects of neurofeedback scale on measures of Craving of drug-dependent patients is more different. Intervention effect on dependent variables was examined after observing ensure consistency assumptions the results shown in Table 3.

Table 3

Results of univariate analysis of covariance (ANCOVA) related on comparison Craving between research groups.

| Indexes | Total squares | degrees of freedom | Mean square | Degrees of freedom | The significance level | Eta factor / test power |
|----------------|----------------------|---------------------------|--------------------|---------------------------|-------------------------------|--------------------------------|
| group | 29299.32 | 1 | 29299.32 | 481.08 | 0.0001 | 0.93/1 |
| error | 2253.39 | 37 | 60.9 | | | |
| Total | 31872 | 39 | | | | |

As seen in table 3, the differences of drugs Craving post-test amount between experimental and control groups with pretest control is significant by results of the study the effectiveness of neurofeedback on reducing drugs Craving . This means that drugs Craving scores mean in the experimental group was significantly decreased ($p \leq 0.01$). According to the effect or difference (Chi Eta), 93 percent of the variations in drugs Craving variance are the result of neurofeedback method. Results of the calculations show that group factor or the intervention on the experimental group about Craving scale was statistically significant. In conclusion, intervention variable makes a difference in scale between the experimental and control groups. Thus reducing Craving amount and intensity of receiving neurofeedback, drug-dependent patients compared with the control group patients was significant.

3. Results

Due to the efforts and educational and treatment researches of many researchers in recent years on drug dependence disorder, likewise , we see Statistics growing phenomenon and social trauma - which practices and new treatment methods couldn't be held accountable. The results of this study indicated that light therapy by Neurofeedback decreased Craving in dependent – opium narcotic drugs patients. The results are in line and consistent with studies by Sebastian et al. (2015), Sebasteen et al (2007), Scott et al. (2005), Canterbury et al. (2013) and Anternyr et al.

(2013) and also internal studies by Dehghani et al. (1394), Jyrayy et al. (1394) and Ghaderi et al. (1394). In these researches, educational and therapy Neurofeedback method has been effective on reducing Craving amount and intensity of patients. According to the recent study, Neurofeedback than other therapy methods is effective to improve brain self –regulation and its dependent symptoms such as Craving.

Neurofeedback method is effective on feet area and cockle stream and to change chemical brain Noro by the improvement and adjustment of electrical brain waves at a specific point that controls the psychological realm and other conventional methods such as chemotherapy do this activity but during treatment is more and follow possible return and side effects .

Studies (Hammond et al. 2003; Wilson et al. 2006, Svkhadz et al. 2008, Qadri et al. 1394, Jyrayy et al. 1394) at home and abroad show that the majority of studies on the case; or a few studies was conducted with few numbers and special variables that this makes to reduce generalizability power and its reliability and validity. This study try to study this concept effectiveness of the method neurofeedback in the field of drug dependence disorder, especially in Craving variable with Compliance scientific principles of experimental and quasi-experimental research because of having pretest and posttest design , control and experimental groups as well random assignment of groups . The study has limitations including: Psychological- neuroscientist Studies have the intricacies of its own. Control of confounding variables virtually is impossible, the ethical considerations of research in the humanities makes it be impossible to study completely homogeneous groups. Despite the study can identify using the placebo in-group, that controlling other effective variables in the treatment of drug dependence disorder to the extent changes in the dependent variables such as decreasing Craving of patients is result of the effectiveness and efficiency of education neurofeedback treatment method.

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