

Effects of exercise training on mental disorders in male cured addicts

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ABSTRACT

*The purpose of present study was to investigate the effects of exercise training on mental disorders in male cured addicts. Therefore, 50 males who addicted to Crystal Methamphetamine were voluntarily participated in a pretest-posttest randomized-groups design. The experimental group participated in selected exercise training for 8 weeks. Mental health of two groups was measured in pretest and posttest using symptoms checklist of mental disorders (SCL90- R). Results of 2(group)*2(test) MANOVA with repeated measures of last factor in $p < .05$ indicated that exercise led to significant decreases in somatization, depression, interpersonal sensitivity, anxiety, paranoid ideation, and psychoticism, but it had not significant effects on obsessive-compulsive, hostility, and phobic anxiety. Thus, 8 weeks of exercise training, as an effective non-drug way, can be utilized to decrease mental disorders in male cured addicts.*

Keywords: Crystal Methamphetamine, addiction, physical activity, mental health

INTRODUCTION

Addiction to narcotics is one of the main concerns and problem sustained by today's world. Whereas, such addictions have inhibitive effects on development of societies, they are considered as serious and solicitous issues of public health all over the world [1]. Crystal Methamphetamines are one of the commonly used narcotics throughout the world. As the main constituent of Crystal, amphetamine has direct effect on central nervous system (CNS) which leads to sudden release of dopamine from brain. This chemical compound itself stimulates brain cells and induces aggressive and uncontrollable behaviors as well as increase in body movements. In case of long administration of crystal methamphetamine, other symptoms such as depression, anxiety, memory loss and schizophrenia-like moods including visual and audible hallucinations and pessimism will be manifested and attached to mentioned effects [2]. Studies on addiction indicate that most addicts suffer from acute personality disorders. In other words, they are considered patients in two aspects. The first aspect deals with chemical dependency which is observable in the mentioned persons, while the second deals with psychological disorders [3]. These studies indicate that personality disorders may be considered as a major role in addiction and/or bother drug addicts during the period of drug taking as an effect of addiction [4].

Non-drug treatment ways, especially for treatment of addicts' psychological symptoms can play a key role beside drug-based treatments. Physical activity, as one of the effective method, helps remedy addicts during treatment procedure. By relying on abilities and inabilities of addicts as well as their psychological characteristics, the above mentioned method has been applied. Many studies have indicated the considerable role of exercise in improvement of addict's mental health and decrease of personality disorders suffered by such persons. The results of limited studies in this area demonstrate significant decrease in addicts' personality disorders [5]. Rasouli has been performed long-term studies on the effect of selective physical activities among cured addicts. He found that in early phase of

addiction quitting, some cognitive activities, such as chess, dart throwing, and Mench Argere Dich Nicht game and in next phases of treatment, physical activities, such as volleyball, football, and Persian traditional sport (Varzesh-e-Bastani) can facilitate treatment process [6].

In recent years, by recognition of Narcotics Anonymous (NA) treatment method, as one of the most effective methods for addiction quitting, several addicts have extricated themselves from the trap of addiction. Some of them demonstrate many admirable talents which make them prepared for entrance to society. The other considerable point concerning such people is that they suffer from personality disorders so that they would not be successful in doing many works [3].

Unfortunately, Crystal administration has been grown in Iran recently and no study has focused on the role of physical activity in treatment of mental disorders suffered by Crystal user addicts. Of course, limited studies have been carried out concerning the addicts who take other narcotics except crystal in obligatory environments such as prison. These addicts acutely suffer from severe psychological disorders because of Coercion for cessation of drug use as well as their wickedness. Considering above mentioned facts the current study performed to investigate the effect of selected physical exercise training for 8 weeks on mental disorders suffered by addicts who have been cured through NA treatment method in a voluntary environment.

MATERIALS AND METHODS

Fifty volunteer cured addicts in age range 18-40 years old who used to take crystal methamphetamine as main narcotics for 4-8 years were selected from Verdij rehabilitation camp (a specialty camp in Iran, between Tehran and Karaj, for quitting addiction to crystal methamphetamine). Their treatment period had taken between 1 to 3 months. Participants were randomly divided into two groups and participated in a pretest-posttest randomized-groups research design. The Symptom Checklist-90-R (**SCL-90-R**) [7] was used to collect required information about psychological problems and symptoms of psychopathology. This self-assessment includes 90 items in 5-point Likert scale (0: not at all, 1: slight, 2: moderate, 3: severe, 4: very severe). It also includes psychological symptoms in 9 aspects of somatization (SOM), obsessive-compulsive (O-C), interpersonal sensitivity (I-S), depression (DEP), anxiety (ANX), hostility (HOS), phobic anxiety (PHOB), paranoid ideation (PAR), and psychoticism (PSY). Seven extra items exist in this checklist which has not been classified in none of these aspects. This checklist assesses different moods of addicted persons within a week.

The experimental group carried out selected exercise training for 8 weeks, three 90 min sessions per week in gym of Verdij camp. Addicted persons were requested to carry out light and non-severe physical activities, such as warm-up, walking, slow running, stretching, dart throwing, and billiard, in early sessions. When their physical fitness improved, calisthenics exercises and soccer practices were added to the exercise protocol. Exercise intensity at the early sessions was 50-60% of maximal heart rate (220-age) and intensity increased to 65-80% at the end of 8 weeks. Data analyzed by 2(group) * 2(test) MANOVA with repeated measures of last factor and t test with Bonferroni correction. Significance level was considered $p < .05$.

Table 1. Descriptive statistics of all dependent variables for experimental and control groups

Group	variables	pretest	posttest
		Mean \pm SD	Mean \pm SD
experimental	somatization	0.489 \pm 1.000	0.358 \pm 0.528
	obsessive-compulsive	0.589 \pm 1.372	0.395 \pm 0.824
	interpersonal sensitivity	0.617 \pm 1.236	0.482 \pm 0.808
	Depression	2.085 \pm 1.554	0.477 \pm 0.569
	Anxiety	0.747 \pm 1.231	0.443 \pm 0.537
	hostility	0.640 \pm 0.880	0.340 \pm 0.433
	phobic anxiety	0.441 \pm 0.952	0.298 \pm 0.537
	paranoid ideation	0.640 \pm 1.730	0.418 \pm 1.246
control	psychoticism	0.646 \pm 1.313	0.460 \pm 0.660
	somatization	0.582 \pm 0.789	0.456 \pm 0.676
	obsessive-compulsive	0.684 \pm 1.272	0.494 \pm 1.516
	interpersonal sensitivity	0.690 \pm 1.227	0.583 \pm 1.311
	Depression	0.715 \pm 1.273	0.586 \pm 1.326
	Anxiety	0.650 \pm 1.005	0.437 \pm 1.160
	hostility	0.747 \pm 0.973	0.463 \pm 0.639
	phobic anxiety	0.552 \pm 0.806	0.429 \pm 0.772
paranoid ideation	0.750 \pm 1.840	0.620 \pm 1.747	
psychoticism	0.569 \pm 1.336	0.563 \pm 1.312	

RESULTS

Tables 1 indicates mean \pm SD of psychological disorders symptoms of experimental and control groups in pretest and posttest. In addition, figures 1 and 2 indicate symptoms of psychological disorders of two groups in pretest and posttest, respectively.

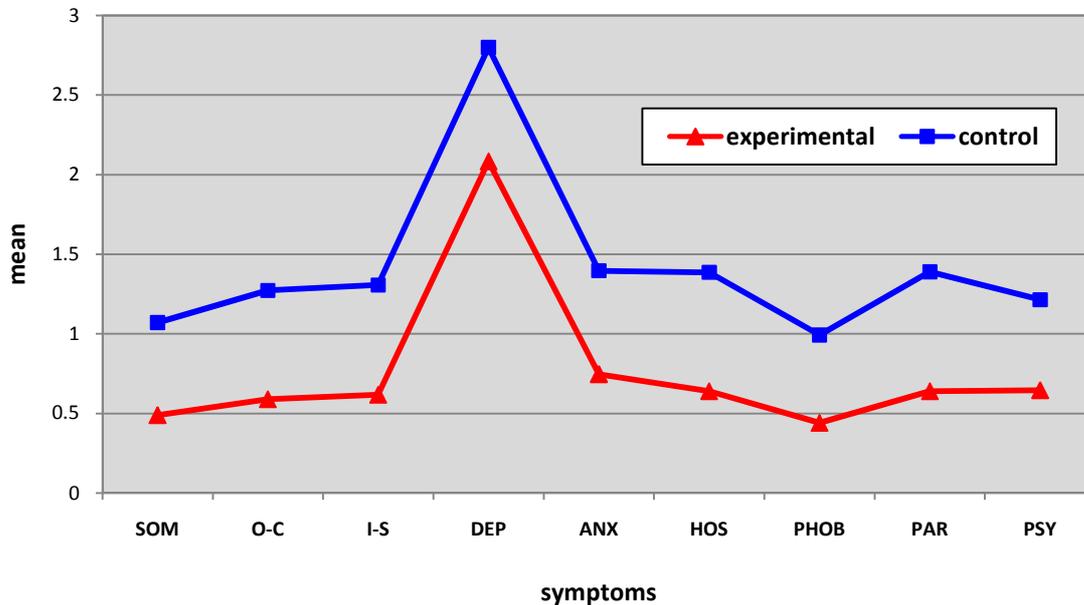


Figure 1. SCL-90-R symptom profile for experimental and control groups in pretest.

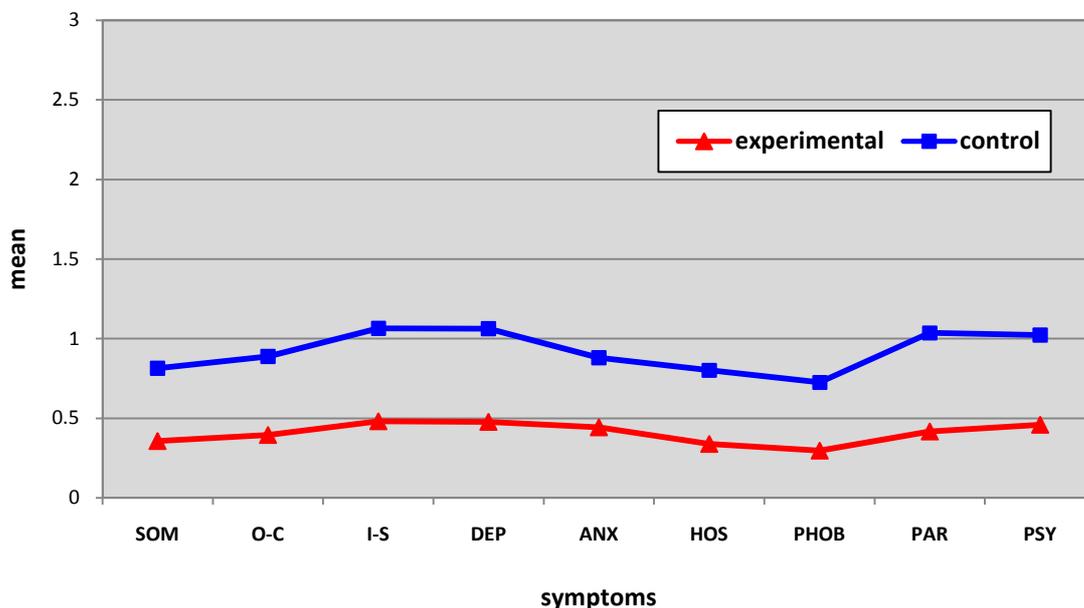


Figure 2. SCL-90-R symptom profile for experimental and control groups in posttest.

Based on the results of 2 * 2 MANOVA with repeated measures of last factor, the main effect of group was not significant ($F_{(9, 40)}=1.724, p=.115$). Conversely, the main effect of test, and interaction of group and test were significant ($p<.001, F_{(9, 40)}=7.090, p<.001; F_{(9, 40)}=5.887$, respectively). Results of post hoc test of 2*2 ANOVA with repeated measures of last factor indicated the significant interactions for SOM ($F_{(1, 48)}=10.745, p=.002$), O-C ($F_{(1, 48)}=36.596, p=.001$), I-S ($F_{(1, 48)}=14.235, p=.001$), DEP ($F_{(1, 48)}=6.754, p=.012$), ANX ($F_{(1, 48)}=21.933, p=.001$), PHOB ($F_{(1, 48)}= 21.933, p =.001$), PAR ($F_{(1, 48)}=5.987, p=.018$), PSY ($F_{(1, 48)}=16.270, p=.001$).

Within groups pairwise comparisons by paired t test with Bonferroni correction ($p < .025$) showed significant decreases in SOM ($t_{24}=5.445$, $p=.001$), O-C ($t_{24}=5.445$, $p=.001$), I-S ($t_{24}=3.99$, $p=.001$), PHOB ($t_{24}=5.057$, $p=.001$), PAR ($t_{24}=4.789$, $p=.001$), and PSY ($t_{24}=4.972$, $p=.001$) for experimental group and significant increases in O-C ($t_{24}=4.972$, $p=.006$) and DEP ($t_{24}=-3.018$, $p=.006$) for control group, but changes of other symptoms in control group were not significant ($p > .025$). Between groups pairwise comparisons by paired t test with Bonferroni correction ($p < .025$) showed no significant differences between symptoms of psychological disorders of experimental and control groups in pretest, but in posttest, experimental group's O-C ($t_{48}=5.465$, $p=.0001$), I-S ($t_{48}=-3.319$, $p=.002$), DEP ($t_{48}=-5.002$, $p=.001$), ANX ($t_{48}=-4.998$, $p=.001$), PAR ($t_{48}=-3.19$, $p=.003$), and PSY ($t_{48}=-4.477$, $p=.001$) were significantly lower than control group.

DISCUSSION AND CONCLUSION

The purpose of the present study was to investigate the effect of selected exercise training for 8 weeks on mental disorders of male cured addicts in a voluntary environment. The findings indicated significant reduction in symptoms of psychological disorder of men who were addicted to crystal methamphetamine during eight weeks of physical activity.

According to the results, physical activity decrease SOM, but this effect was no significant. This finding is consistent with Bakhsheshi [8], Blumental *et al.* [9], and Mogharnesi, Kushan, Golestaneh, Ahmadi, and Keivanfar [10] and inconsistent with Valizadeh [11]. Valizadeh performed Cooper test in last day and this test can cause muscle soreness and pain. Some feelings like self-worthless, frustration, tendency for suicide are indicative of depression (DEP). Comparison of control and experimental groups' DEP in posttest indicated that exercise had great impact on decrement of DEP. In fact, results of the study are consistent with Bakhsheshi [8], Mogharnesi *et al.* [10], and Guskowska [12]. Increment in the level of neurotransmitters, such as serotonin, dopamine, endorphin, and enkephalin in brain can cause to happiness and decrease in the symptoms of DEP [13].

Psychoticism (PSY) is accompanied with seclusion. Patients suffering from severe PSY disorder have delusion and try to propagate their thoughts. After intervention in the present study, PSY in experimental group was lower than control group. This finding was consistent with the results of Holley, Crone, Tyson, and Lovell [14] and Knöchel *et al.* [15]. They attributed this considerable impact to sociability and the feelings of dependence to group. Some symptoms such as insomnia, psychological tensions, aggression, and fear are the symptoms of anxiety (ANX). The positive effect of selected exercises on the reduction of ANX is one of the results of this study. This finding was consistent with the results of Bakhsheshi [8], Mogharnesi *et al.* [10], Guskowska [12], and Sheehan [16]. Anxiety has direct relationship with increment of norepinephrine and decrement of GABA neurotransmitter. The studies indicate that physical activity increases GABA neurotransmitter and inhibits norepinephrine [17].

Findings of obsessive-compulsive (O-C) were consistent with Abrantes *et al.* [18] and Solgi [19]. According to evidence, increase in secretion of growth hormone leads to develop new connection between neurons in brain. Therefore, these connections reduce the symptoms of O-C. In addition, group activities focus addicts' attention to performance of sport skills. Therefore, their concentrations would be deviated from performing compulsive and obsessive activities [18,19]. Phobic anxiety (PHOB) is a persistent and illogical fear against an object or a certain stimulus. Reduction of PHOB after eight weeks exercise training in present study was no significant. This finding was consistent with Kalat [17] and Solgi [19]. This change can result from enhanced physical fitness followed by decreasing response of autonomic nervous system to fear.

Hostility (HOS) is related to negative mood due to aggression and angeriness. Exercise in the present study resulted to decrease HOS, but it was no significant. This finding was inconsistent with Kalagone [20] and Shojaei and Alamdariloo [21]. Wicked and aggressive people are not allowed to enter the camp and it is possible that low level of HOS in the Verdij's addicts is the reason of this result. Results indicated the significant reduction in PAR and I-S after eight weeks exercise. These findings were contradicted with results of Solgi's study [19]. Possible causes of such contradiction may be related to the feeling of safety and social acceptance that are very important for addicts. However, the issue was not so important for the people who were involved in the study carried out by Solgi.

According to the results, physical activity regarding addicts' physical and psychological abilities can be a nondrug treatment for reducing the psychological disorders of people who used to be addicted to crystal methamphetamine but are being treated. In addition, it is suggested to pass athletic coaching classes for the social workers who intend to work with addicts. This will let the convalescents experience lesser mental disorders and spend their time in an intimate atmosphere with sport programs in their routine activities in rehabilitation centers and addiction quitting camps.

REFERENCES

- [1] Margolin A, Beitel M, Schuman-Oliver Z, Avants SK, *AIDS Educ. Prev.*, **2006**, 18, 4, 311-322.
- [2] Hilariski C, *Addiction, Assessment, and Treatment with Adolescents, Adults, and Families*, Haworth Social Work Practice, Binghamton, **2005**.
- [3] Hamilton RWT, Samples P, *The Twelve Steps and Dual Disorders*, Hazelden, **1995**.
- [4] Bakhsheshi MF, MSc thesis, Kharazmi University (Tehran, Iran, **2000**).
- [5] Guzkowska M, *Psychiatr. Pol.*, **2004**, 38, 4, 611-620.
- [6] Rasouli MH, *Sport and Addiction Treatment*, Etelaat, Tehran, **2011**.
- [7] Derogatis LR, *Symptom Checklist-90-Revised: Administration, scoring and procedures Manual*, National Computer Systems, Minneapolis, **1994**.
- [8] Bakhsheshi MF, MSc thesis, Kharazmi University (Tehran, IR, **2000**).
- [9] Blumenthal JA, Emery CF, Madden DJ, Schniebolk S, Walsh-Riddle M, George LK, Higginbotham MB, Cobb FR, Coleman RE, *J Gerontol*, **1991**, 46, 6, 352-361.
- [10] Mogharnesi M, Kushan M, Golestaneh F, Ahmadi MS, Keivanfar F, MSc thesis, Sistan & Baluchestan Medical Science University (Sistan & Baluchestan, IR, **2008**).
- [11] Valizadeh R, MSc thesis, Chamran University (Ahvaz, IR, **2006**).
- [12] Guzkowska M, *Psychiatr pol*, **2004**, 38, 4, 611-620.
- [13] Salehian MH, Gursoy R, Aftabi GR, Sardarudi MT, Anvari ZD, *Eur J Exp Biol*, **2012**, 2, 4, 1008-1011.
- [14] Holley J, Crone D, Tyson P, Lovell G, *Brit J Clin Psychol*, **2011**, 50, 1, 84-105.
- [15] Knöchel C, Oertel-Knöchel V, O'Dwyer L, Prvulovic D, Alves G, Kollmann B, Hampel H, *Prog Neurobiol*, **2012**, 96, 1, 46-68.
- [16] Sheehan M, *Clin Psychiat*, **1991**, 106, 20, 33-37.
- [17] Kalat JW, *Biological Psychology*, Cengage Learning, Wadsworth, **2008**.
- [18] Abrantes AM, Strong DR, Cohn A, Cameron AY, Greenberg BD, Mancebo MC, Brown RA, *J Anxiety Disord*, **2009**, 23, 7, 923-927.
- [19] Solgi Z, MSc thesis, Razi University (Kermanshah, **2009**).
- [20] Kalagone P, *J Psychiat Ment Health Nurs*, **2004**, 11, 476-483.
- [21] Shojaei S, Alamdariloo GH, *Res Except Children*, **2007**, 6, 4, 855-870.