



RESEARCH PAPER

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The effect of 12 weeks of exercise on prevention of addiction relapse in women treated

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Article published on May 16, 2013

Key words: Addiction, relapse to drug addiction, women addiction, addiction treatment, exercise training.

Abstract

The aim of this study is to explore the effects of 12 weeks of exercise and physical activity on prevention of addiction relapse in addicted women who had managed to quit using drugs. The research method is semi-experimental. The research population included addicted women who had been treated and no more used addictive substances. The sample consisted of 40 addicted women who were proved to have been treated by Rapid-Test urine test. Samples were divided into two groups of 20; one as experimental group who were given exercise and the other 20 were merely subject to health monitoring as the control group. Statistical methods including independent t, Mann-Whitney post hoc and Pearson correlation test were used. At the end of the project period, all subjects were given urine test and the samples were evaluated using TLC method. The results showed that after 12 weeks 8 subjects had relapsed back into drug addiction, but in the experimental group only one had relapsed. No significant difference in age or the duration of abuse was found in the groups, so the results of this study may be attributed to the effect of physical activity during the 12-week duration of the project. Statistical evaluation showed that the difference was significant. From the findings of this study it can be inferred that diverse and uncompetitive aerobic exercise, can be effective in the prevention of relapse in addiction in treated women and reasonable exercise appropriate with the level of physical and mental health of the subjects can be used as a low-cost, non-invasive and effective method in the treatment and prevention of relapse to drug abuse.

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Introduction

To alleviate the pain related to trying to get food for survival, tried to find methods and necessary materials and gradually managed to discover many soothing chemicals (Botvin *et al.*, 2000). With common characteristics including relief of pain of reduction of stimulation of the nervous system, drugs were the oldest materials that human obtained from the poppy plant and gradually from the sap extracted from the poppy plant called opium there came dozens of other narcotics and analgesics. These substances had been widely used for medicinal purposes for centuries (Botvin *et al.*, 2000). Sumerians were the oldest ethnic group who used opium and due to its anxiety and depression reducing effects and thus improving the mood it became known in the beginning as the "joy plant" (Botvin *et al.*, 2004; Margolis *et al.*, 1998). At the time of Socrates opium and its clinical use has been mentioned (Botvin *et al.*, 2000; Read *et al.*, 2003). A variety of addictive substances with different features and different impacts on the human physiologic and nervous systems have "tranquilizing" or vice versa "stimulation and hyperactivity" effects.

Thus drugs can be divided into two categories: "narcotic" or reducer of central nervous system activity and "stimulant" with increasing effects on CNS activities (Furby *et al.*, 1992).

Drug abuse addiction is one of the greatest dangers that threaten human societies, especially the younger generation, so that the World Health Organization considers drug addiction along with AIDS, environmental pollution, population explosion one of the four main problems that humanity faces (Botvin *et al.*, 2004).

Mokri citing Goldstein 1994 says: use of addictive drugs, even for once prompts physical and emotional changes and disrupts the user's behavioral balance (Furby *et al.*, 1992). United Nations Office on Drugs and Crime statistics show that about 250 million people worldwide are addicted to substances and this

is indicative of the increasing the number of addicts in the world compared with 2005 which was estimated to be about 250 million (46). While Sorson 2003 showed that the annually 9.5% of the American population use drug for fun, only 20 percent of these people are likely to continue using drugs, which would be less than 2 percent of the population. (Severson, 2003)

Several studies have been done on addiction and mood disorders, antisocial behavior, drug and mental health problems. Some researchers assert that more than one third of addicts suffer from anxiety disorders, one-third mood disorder and 18 percent have antisocial personality and about 7 percent of them are schizophrenic (Albert *et al.*, 2003). Phobias, anxiety, depression, variety seeking and neophilia (novelty seeking), aggressiveness and behavioral disorders are among the most common psychological causes of addiction and bad parenting, being unparented, overworking, under-working, presence of an addict in the family, abundant availability of drugs in the society and other factors are sociological reasons of drug abuse (Gerrard *et al.*, 1996).

Another study finding indicates that addiction is a relapsing disease and there are many factors associated with it in medical, psychiatric, family, employment, legal, financial and intellectual areas. Addiction like any other chronic disorder requires management of treatment during the time (Severson, 2003). Despite the advancements achieved in the treatment of addiction, relapse to heavy and uncontrollable periods of use is still a common problem. Mostly addicts resume drug use after detoxification and entry to rehabilitation, within 90 days after the drug treatment process has started (McKay *et al.*, 2006). Vandpering and Hasen 2006 contend that the problem of addiction relapse is there even after long spells of cleanness and interruption of drug use (Yan *et al.*, 2009). Reuse of substances in the addicts having completed treatment process is a common phenomenon (Veilleux *et al.*, 2010).

More importantly, women are more at risk because they are more prone to anxiety, depression and mental health problems. Addition to methamphetamine in women in recent years is probably because women are more after shapeliness and start with smoking and continue with using the so-called slimming pills and finally end up using methamphetamine and cocaine. Methamphetamine causes severe mood swings; loss of appetite, dry mouth, and greater unpleasant physical and mental symptoms in women than in men (Botvin *et al.*, 2004).

The negative impact of addiction in women on children's upbringing, likely incidence of infectious diseases caused by shared injection needles and/or need to procure drugs is far more common than in men.

Moore and Vorch 2005 argue that the role of exercise and physical activity is well established in many aspects of health including cardiovascular and muscular health as well as immunity and prevention from certain physical and mental diseases (Moore *et al.*, 2005). Undoubtedly physical activity is an effective agent for the prevention of drug abuse. Another researcher maintains prevention of neurological problems with sports and aerobic and non-competitive physical activity has been observed in many studies (Kopstein, 2001). In a research conducted in the countries of Iran, Pakistan, Saudi Arabia, Ireland and Great Britain addicted women referring to addiction treatment centers were given physical activity according to the country's cultural and social characteristics. After the end of the exercise period, women who had used exercise believed that sports had played an important role in reducing their addiction (Petratis, 1999). In a 1999 study, Marcus *et al* 15 subjects were randomly selected to have one mile walk on different days, the findings. The findings showed that there was a significant relationship between reduction of tendency to cigarette smoking among 20-minute after the completion of exercise (Marcus *et al.*, 1999).

Greenfield *et al* found in separate studies that the role of nutrition and moderate physical activity is an effective one in improvement of mood and increase of the ability to deal with stress and its symptoms and treatment of irregular breathing in drug addicts (Greenfield *et al.*, 2007). McKay *et al*, 2006, in a research on 620 alcoholic men with moderate exercise at 1.65 kcal per kg body weight for 6 months, found that with improved mood and better coping with risk situations the risk of relapse into addiction is reduced (McKay *et al.*, 2006). In Iran no direct research in the field of sport and its impact on drug treatment or harm reduction has been carried out. In a research, the effect of exercise on drug demand reduction in the youth population and the results were positive and significant (Botvin *et al.*, 2004). The aim of this study was to look into the effects of 12 weeks of exercise and physical activity on the prevention of relapse to drug addiction in addicted women who have managed to quit.

Materials methods

Given the objectives of the project this research seeks to study the effect of 12 weeks exercise on the withdrawal length or prevention of the relapse in addicted women having managed to give up.

The research population includes all drug abusing women who have managed to give up addiction and / or prevent relapse to addiction throughout greater Tehran and Alborz Province and their cleanness has been proved by urine test. The subjects in this study were 40 of addicted women who had completed treatment period successfully and had managed to give up addiction and their refusal to use drugs had been proved by means of urine Rapid-test method. An important variable in this study is to assess "staying clean" or "prevention of relapse to addiction". The context of this study is "semi-empirical".

The main inclusion criterion included previous addiction proved, having been treated in a treatment center and finally being proved to be clean using urine test upon presenting the written test result to

the officials of community organizations and the certificate being sighted and recorded by the researcher.

There were other criteria such as type of substance abused; intensity and length of addiction, mode of use and even the age of subjects were also considered in order to study the effect of personal characteristics of the subjects. Volunteers' relative health was established by an associate physician and their fitness for moderate aerobic exercise, their age, and physical condition represented the main criteria of choosing and categorizing the subjects. The selected subjects were placed into two groups of 20 with virtually identical demographic profile. The experimental group was given exercise and the control group was given health monitoring.

The stages of exercises were performed under the supervision of the researcher and with volunteer cooperation of the some of the addiction therapists and the warm-up stage took 5 to 10 minutes and included moderate to average stretching and rhythmic contraction of the large muscles of the body by jogging, skipping and walking or performing various exercises and the cool-off included 5 to 10 minutes of stretching and reduction of physical activity down to the resting heart rate. The necessary briefing was provided by the physician regarding diet, hydrating body before the exercise, appropriate outfit and footwear for the exercise as well as the possible symptoms of cardiovascular diseases during the exercise like chest pain which increases as exercise continues and reduces with rest. The subjects were asked to stick to health and safety tips and inform the researcher or his associates if any pain and/or dizziness should occur during the exercise. After completion of the project period subjects in both groups were asked to attend the gym and were given urine tests without prior notice and the urine samples were dispatched to Saba accredited laboratory in Karaj for TLC test. The results of these tests in both groups which indicated cleanness and staying clean or relapse to addiction were recorded as posttest results.

After collection of unprocessed data and the research findings, descriptive and inferential statistics indices were used for statistical description and analysis. Independent t test was used to examine the significant pretest and posttest mean difference of the variables measured in either group while dependent t test was used to compare mean differences in both groups. Pearson correlation test and non-parametric Mann–Whitney U test were used for data analysis. The significance level was determined at 0.05. To draw the graphs, Excel 2003 was used due to its higher potentials. SPSS application was used for data analysis.

Results

In this part first of all the demographic characteristics of the subjects according to age, length of addiction and the type of abused substance and the mode use as well as family status in terms of being married, single or divorced are discussed using descriptive statistical methods including mean and standard deviation. Using inferential statistical methods such as Pearson correlation test and Mann–Whitney test the research findings including relapse rate in both groups were evaluated. The results of the research are presented in two parts including; descriptive and inferential findings.

Overall the research findings indicated that performing appropriate exercise can be significantly more effective in treated addicted women who exercised than those who do not exercise. The findings of this research are presented in the following tables and graphs:

The frequency of subjects using different narcotics and stimulants in both groups indicates that there is no significant difference; in the experimental group two used opium concentrate and 1 used several drugs which was indicative of their more intense addiction. As different drugs can be consumed in different ways the above tables indicates that smoking and inhaling is most prevalent. Also there is no significant difference between the two groups. Intravenous

injection which is a high risk method is equally prevalent in both groups. Only two subjects consumed drugs intranasally.

The number of married subjects was equal in both groups and there was no significant difference between divorced subjects which indicates similar family status in both groups.

In this research 7 from the control group and 1 from the experimental group relapsed to addiction after 12 weeks so the difference is statistically significant.

Discussion and Conclusion

The results of this study showed that 12 weeks of proper exercise can be significantly effective in prevention of relapse to addiction in treated women. In this study 40 drug abusing women who had been treated and had managed to give up drug abuse were studied. They were divided into two control and experimental groups of 20. One group was exposed to exercise intervention and the other group was only subject to health monitoring. After 12 weeks of exercise intervention, 7 in the control group who had not exercised and had only been health monitored relapsed to drug abuse while in the experimental group who has exercised only 1 relapsed to addiction. According to international statistics indicating that 25 to 30 percent of treated addicts would relapse within three months from giving up and by one year from giving up the figure would increase to 93 – 97 percent, the results of this study which is indicative of 35% relapse are consistent with international statistics. When asked, those who relapsed usually

answered that the relapse time was the very first days after giving up and at most within two weeks; so the relapse time in the subjects of this study is consistent with the findings of Olivia (Olivia *et al.*, 2003).

The 5 – 10 percent higher relapse rate of women in this study than the figures announced by UNODC in 2005 further testifies the previous findings indicating that women are more prone to relapse to addiction. Most local and international studies have focused on men and few studies have focused on addicted women and their characteristics and the difference in findings can probably be attributed to this reason. The larger number of relapsing women and the more rapid relapse in women compared to the international norm in this study are compatible with the provisions of women substance abuse management protocol released by the ministry of health and medical education. Marital status and in general the level of family support is among other variables significantly effective in relapse to addiction. 6 out of 7 relapsing subjects in the control group and 1 in the experimental group adding up to 7 out of the 8 relapsing subjects were divorced and lacked proper family support. The role of family support and living with family members as the symbol of family support on the prolonged recovery and staying clean (resiliency) with emphasis on moral values and spiritual and emotional support by other members of the family represented the subject of another study conducted which indicated that married subjects are more enthusiastic to give up addiction and remain clean than divorced ones who live alone. The results of these two studies are compatible.

Table 1. Studied groups differentiated according to the mode of consumption.

Supplementation method	inhaled	Intravenous injection	Intranasal	Total
Control group	12	6	2	20
Intervention method	14	6	0	20
Total	26	12	2	40

All subject using methamphetamine, except for one who had started addiction directly with methamphetamine, had previously used other

substances narcotics in particular and had recently started using crystal met. These findings are also consistent with those had studied 1108 addicts

referring to four clinical treatment centers (Friedman *et al.*, 2004). This study revealed that 224 out of 396 addicts to stimulants (crystal met) had previously used other narcotics. Method of consumption in terms of being high risk (intravenous injection) or low risk (smoking and inhaling) is another factor signifying the intensity of addiction and the level of remaining clean. In this study three used injection heroine, one used inhaled opium and four used inhaled met. Out of 9 users of crystal met and cocaine, which are considered heavy substances, 4 relapsed to addiction (Elisabeth *et al.*, 2004). Out of 31 who used narcotics in either group, 11 used the

high-risk injection method while out of the 4 relapsing subjects 3 used injection method. These results too are consistent with the findings of another study signifying the role of demographic characteristics on the degree of relapse to addiction.

This study revealed that most of the subjects and in particular those who had relapsed came from violent and mentally stressful families. This is also consistent with the provisions of substance dependence management protocol in pregnancy, childbirth, lactation and neonates released by Ministry of health and medical education in 2010.

Table 2. Studied groups differentiated according to marital status.

Groups	Married	single	Divorce	Total
Control group	10	2	8	20
Intervention Group	10	0	10	20
Total	20	2	18	40

Table 3. Studied groups differentiated according to relapse or non-relapse.

Groups	Addiction relapse	Non-addiction relapse	Total
Control group	7	13	20
Intervention Group	1	19	20
Total	8	32	40

Table 4. Testing hypothesis 1: there is a significant difference between the control and experimental group in terms of relapse to addiction.

Independent sample T test	t	Df	sig	Result
Addiction relapse	2.494	38	0.017	P < 0.05

The experimental group represented significantly less relapse to addiction than the control group.

Relatively improved quality of life and enhanced level of mental and physical health in the subject in experimental group compared with control group which finally ended up in a significant difference in the number of relapsing subjects in the two groups were evaluated to turn out that these findings are consistent with some other researchers who had found out the impact of improved lifestyle including balanced diet and proper physical activity. In this study the main variable was exercise and given the subjects being identical in both groups it turned out to be the most effective factor in the study. If the

significant difference in the number of clean subjects in the two control and experimental groups is attributed to physical activity and performing various exercise by the experimental group subjects, this can probably be caused by change in the physical indices such as efficiency of cardio-respiratory systems, increased muscular power and improved immunity system in the experimental group subjects which is consistent with the findings of another study on the impact of moderate intensity exercise of improvement of physiologic indices in ordinary and healthy subjects. This is also consistent with the findings of

another study. These researchers studied on the impact of appropriate exercise and physical activity on improvement of cardio-respiratory indices as well as reduction of drug use demand in addicts under treatment. Given the impact of increased anxiety and depression as well as aggressiveness on prevalence of drug addiction any positive change in mental parameters can be important. Positive changes in mental parameters in control group subjects were observed which are probably due to physical activity the role of which on prevention of addiction and/or prevention of relapse to addiction has been established and this is consistent with some other studies. One likely reason for the effect of exercise on reduced demand for drug use in the subject in the control group is increased release of endorphin and enkephalin that former being a natural pain reliever and narcotic which is exceptionally stronger than morphine which is extracted from opium and the latter being the very hormone known as joy factor and thus the increased release of these substances following exercise while consistent with the findings of another study can reduce pain and muscle cramp and restlessness caused by withdrawal (Ball, 2000). This unpleasant state is known as withdrawal symptoms or lowness and in most addicts under treatment can be the cause of longing for drug use and relapse to addiction. Any measure that can lessen withdrawal symptoms will be effective in remaining clean from addiction. This finding is also fully consistent with the results of another study that looked into the interaction of exercise, addiction and endorphin. The researcher, however, acknowledges that in this study the level of endorphin, dynorphin, beta endorphin and enkephalin of the subjects was not measured (Arnau *et al.*, 2008).

Therefore, these points are discussed with probabilities. This research if done in comparison with men who had given up addiction could have produced more scientific results.

Comparing the level of resistance against longing for drugs in men and women could have been useful in

affirming or rejecting the findings of another researcher who maintain that compared with men, women are more inclined towards relapse to drug addiction and show lower endurance. Moreover the said researchers have used subjects who are usually alcoholic or users of marijuana. According to Wim *et al* (2006) addiction is an acute and relapsing problem and social, mental and physical and economic problems result in relapse of addiction and abandoning of treatment (Wim *et al.*, 2006). Randal *et al* (1998) argue that relapse to drug abuse by addicts who have even completed the treatment process is a common phenomenon (Randal *et al.*, 1998). The findings of this study, particularly given the 35% relapse and 45% relapse to addiction in users of stimulants, are consistent with those of previous studies. In total, repeating this study with a larger number of subjects and comparing men and studying more variables can provide addiction therapists and drug control authorities with wider information.

The results of this study suggest that non-competitive and diverse sports and proper physical exercise can be used alongside other drug abuse treatment methods as a useful noninvasive method.

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