Aerobic exercise on mental health of prisoner people

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Abstract

Purpose(s): The present study aimed at investigation the effect of eight weeks aerobic exercise on the mental health (physical complain, anxiety, social performance disorder and depression) of prisoner people with financial or addiction crime in Central prison in Yasouj City.

Method(s): The study was semi experimental. General Health Questionnaire (GHQ-28) used for assessing mental health of the subjects. After completing the GHQ-28, sixty prisoner with low mental health selected and randomly divided into two experimental groups (addict and financial crime groups) and two control groups (addicted and financial crime groups). After performing the exercise protocol by experimental groups, GHQ-28 completed by all subjects again. The data analyzed through independent and dependent t-test.

Result(s): The results showed that aerobic exercise resulted in significant effect on physical complain, anxiety, social performance disorder and depression of addicted and financial crime prisoner. The results also showed that aerobic exercise led to more effect on mental health of addicted people in comparison with financial crime people.

Conclusion(s): Maybe, exercise can remove the poison of blood, improves cardiovascular system, increase mental and physical health of the narcotic addicted people. However, financial crime group increase their mental health also, but our results shows that aerobic training have more effect on the mental health of the addicted people in comparison with financial crime people.

Key words: Mental health, Physical complain, Anxiety, Social Performance disorder, Depression, Aerobic exercise

Introduction

Prison always has been as a place for keeping criminals. However the attitude and the attitude the type of Mannering than prisoner has been different. Beginning the century 18, according to the literatures, the goal of punishment is prevention for repetition the crime. The criminal is a victims of non-regulated social environment in which others have made for him, so should be tolerate him over the past. According to the authorities of Chicago ideology, the goal of prison is primarily punishment or panic establishment for repetition and presentation of crime.

Mental health is an essential factor in order to prevention of crime and also establishing appropriate behavior. Mental health based on world health organization (WHO) not only implies absence of illness and physical defect, but it is a statement that reflects physical safety and social welfare (Boldero. J. And fallon B, 1998).

Because of special conditions of prison, such as leakage of exercise facilities, shortage of enough motivation to participant in activities, inactivity, poverty and lack of movement has been forced to impose a prisoner and their health and wellbeing encounter with risk. So, in these conditions, activity and exercise, especially aerobic exercise in definite time can improve physical and mental conditions. In the other hand, exercise can adjust the prisoners with environment and elevates their tolerance against with physical and mental disorders, aging and decreasing in abilities caused by muscles atrophy. Many studies on exercise and physical and mental health have shown that regular, appropriate and safety exercise must be one of the main actions in the people life and anyone must know at least information about relationship between exercise and decreasing in body abilities before encountering with body abilities reducing and before the anxiety balance become inconsistent (Marco, A.M. and et al, 2005).

There are many factors that endanger mental health of people and encounter them with some disorders such as anxiety, depression and feeling incapability in their social works. Today, experts have been presented various instructions for preventing and discovering on these mental disorders (Esfahani N., 2007).

Aerobic exercise is one of the main suggested prescriptions that has suggested by experts and it is claimed that aerobic training is an essential method to keeping and establishing health and fitness of the human (Hosseini Z, Komasi P., 1990). Aerobic training defines as those training that composed from series of regulated motions that perform with special programs and rhythms (Masoodi F., 2003). Aerobic training is series of
Methods

Subjects

The subjects who were selected for this study are 60 prisoner people with financial crime (n=30) or narcotic addiction (n=30). Subjects were medically examined by a physician before they entered the study. The experimental procedures and potential risks of the study were explained both verbally and in writing to the subjects. A written informed consent form was obtained from each subject at the beginning of the study. The study was approved by the Ethics Committee of the Islamic Azad University Shoushtar Branch, Iran.

Data collection was done through simple random sampling. After selecting the samples, both addicted and financial subjects divided into experimental and control groups, in this way that addicted subjects randomly divided into control (n=15) or training group (n=15). Likewise, financial crimers also randomly divided into control (n=15) or training group (n=15).

Instruments

The General Health Questionnaire (GHQ-28) of Goldberg and Hilier served as the data-gathering instruments. The GHQ-28 includes 28 questions and 4 subscales that include physical complain (A), anxiety (B), social performance disorder (C) and depression (D). Each subscale has 7 questions and the researcher give separate score to each scale and separate score to the whole questions. So, this questionnaire gives 5 scores separately. This questionnaire is well-known and be in other forms such as 12, 30, 60 questions. Anthropometric characteristics of the subjects were assessed in page1 of the questionnaire.

Study design

The study was semi-experimental and applied that done on four groups (two training groups and two control groups). The GHQ-28 was used in order to assessing mental health of the prisoner. After completing the GHQ-28 by population, those people who had low mental health scores (had higher scores in mental health) choose and randomly divided into tow addiction groups (experimental and control) and financial crime groups (experimental and control). After completing the questionnaire by prisoners, we selected 60 subjects (30 addicted and 30 financial crimers). Afterward, experimental groups underwent to the training protocol for 8 weeks.

Aerobic training protocol

The exercise protocol in the present study was 8 weeks aerobic training in this way that the subjects of the experimental groups performed 3 sessions per week, 45 minutes per session with 50-70% of VO\textsubscript{2max} (table 1) in order to assessing the mental health changes after training protocol in people with financial or narcotic addiction of central prison of Yasuj. After selecting the sample, the mental health test performed with
supervising of some prison responsible and social assistant. Body height and body mass of the subjects were measured with the help of height measuring stand and a medical scale. The agility test of 4×9 m was performed before and after training protocol. Exercise sessions accomplished Saturday, Monday and Wednesday of week at 4 to 5 pm in the prison gymnasium.

Table 1. Aerobic exercise protocol in one session

<table>
<thead>
<tr>
<th>Stage</th>
<th>Duration (minute)</th>
<th>Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>Warm up</td>
<td>10</td>
<td>Soothing and jogging</td>
</tr>
<tr>
<td>Exercise</td>
<td>30</td>
<td>Exercise with 50-70% of VO$_{2\text{max}}$</td>
</tr>
<tr>
<td>Recovery</td>
<td>5</td>
<td>Walking (active resting)</td>
</tr>
</tbody>
</table>

Data analysis

Statistical Analysis was performed using the descriptive and inferential statistics that included dependent t-test in order to comparison of pre-test and post-test values of each group and independent t-test in order to comparing the scores of the groups. One way Analyze of Variance (ANOVA) also was used to comparing the scores of the groups. Values of p<0.05 were considered significant. Statistical analyses were performed using the 17 release version of SPSS for Windows.

Results

At first, anthropometric characteristics and descriptive statistic data of the subjects are shown in tables and figures. Afterward, the results of t-test and ANOVA are shown also.

Table 2. Anthropometric characteristics of the subjects

<table>
<thead>
<tr>
<th>characteristic</th>
<th>Mean ± SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age (year)</td>
<td>27.45 ± 3.32</td>
</tr>
<tr>
<td>Height (cm)</td>
<td>168.38 ± 2.43</td>
</tr>
<tr>
<td>Weight (kg)</td>
<td>73.24 ± 3.54</td>
</tr>
</tbody>
</table>

Table 3. Values of mental health of the groups at pre-test and post-test

<table>
<thead>
<tr>
<th>Groups</th>
<th>Pre-test (mean±SD)</th>
<th>Post-test (mean±SD)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Addicted (control)</td>
<td>92.45 ± 2.32</td>
<td>92.39 ± 1.78</td>
</tr>
<tr>
<td>Addicted (training)</td>
<td>93.34 ± 2.22</td>
<td>37.37 ± 4.37</td>
</tr>
<tr>
<td>Financial (control)</td>
<td>94.21 ± 2.87</td>
<td>93.58 ± 1.89</td>
</tr>
<tr>
<td>Financial (training)</td>
<td>91.74 ± 2.43</td>
<td>44.59 ± 3.41</td>
</tr>
</tbody>
</table>

Figure 1. Pre and post-test values of subjects’ mental health of addicted and financial crime groups

Table 4. Comparison of mental health scores of control and experimental groups of addicted and of financial crime subjects at pre and post-test

<table>
<thead>
<tr>
<th>Groups</th>
<th>MD</th>
<th>SED</th>
<th>t</th>
<th>df</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Addicted</td>
<td>-42.71</td>
<td>24.78</td>
<td>-2.78</td>
<td>28</td>
<td>0.005</td>
</tr>
<tr>
<td>Financial crime</td>
<td>-53.60</td>
<td>6.61</td>
<td>-8.10</td>
<td>28</td>
<td>0.001</td>
</tr>
</tbody>
</table>

MD. Mean difference, SED. Standard Error Difference, df. Degree of freedom
Table 4 shows that there was a significant difference between mental health of training and control groups of addicted subjects in post-test. In the other hand, eight weeks aerobic exercise have a significant positive effect on the mental health of addicted people (p = 0.005).

Also, the results of independent t-test in table 4 shows that there was a significant difference between mental health of the training and control groups of financial crime subjects in post-test phase. This means that eight weeks aerobic exercise have a significant positive effect on the mental health of financial crime people and improves it (p = 0.001).

Results of ANOVA shows that there were significant differences in mental health of the control and training groups (addicted and financial groups) after 8 weeks aerobic exercise (F = 4.89, p = 0.004). Also, the result of TUKY test (HSD) shows comparison of means difference of pre-test and post-test of training groups. These results indicate that there was a significant difference in mean difference of pre-test and post-test of two training groups (p = 0.020). Mean difference of pre and post-test of the addicted group is more than mean difference of pre and post-test of the financial crime subjects. This means 8 weeks aerobic training have more effect on mental health of addicted subjects in comparison with financial crime subjects in prison.

Discussion

As the results show, aerobic exercise can affect the mental health of the prisoner people with addiction or financial crime and improves it. Previous researches and the present study indicate that exercise and physical activity have positive effects on mental health. Different types of sport training can lead to improvement in mental health of people. According to the psychologic model of Sjoston, participating in physical activities leads to elevation in people self-esteem. Findings in this case also show that sport exercise results in improvement of individual self-esteem and social relations directly (via contact with the new friends) and indirectly via increasing in self-esteem and making connection between people based on connective pattern that increases their tolerance against to stresses (Sjoston, N., Kivela, S.L., 2006).

Another factor in this topic is Distraction Theory. It is hypothesized in this theory that exercise acts as a deviational factor from emotional stress triggers which can lead to psychologic improvement. It has been proven that continuity in most psychologic disorders such as anxiety, depression and social performance insufficiently is resulted from concentration and emphasize on negative attitudes and thoughts. So, one of the psychologic interference ways that suggested by the experts is: people must be avoided from stressor factors and negative thoughts via participating in sport activities that act as a good deviational way.

Another profile of the effect of physical activity on mental health is biological model. This model indicates that the reasons of changes in mental health through physical activity are biochemical and biological changes (Sjoston, N., Kivela, S.L., 2006). The importance of the effects of physical activity on physical health is evident for all and those subjects who are inactive and have a lower VO_{2max}, are exposed to illness or defective movements. High value of VO_{2max} is one of the positive results of aerobic training that can reduce cardiovascular problems. According to these benefits, people with moderate or high VO_{2max} have higher physical health rather than people with low VO_{2max} (Marco, A.M. and et al, 2005).

There are many studies available that have claimed anti-anxiety effects of exercise. Anti-anxiety effects of exercise can be definite through different mechanism such as psychologic and biophyslogic mechanisms. Exercise can reduce anxiety through elevating physical fitness, changing nervous factor such as stress hormones, changing nervous realizing level which interfere anxiety (Marco, A.M. and et al, 2005). Through psychologic dimension, exercise can reduce anxiety via increasing the level of activity and positive reinforcement and leads to deviation the attention from making-anxiety and treated factors and elevates self-confidence and self-efficacy (Boldero, J. And Fallon B., 1998).

The reason of higher performance of those people who participate in physical activities as follow that exercise and physical activity can increase social interchanges and develop social skills and improve social performance of people (Aase Sagatun and et al, 2007). The possible reasons for contradictory results may be different types of training protocols, age and differences in cultural and social characteristics of subjects.

Reduction in depression following training has psychological and physiological explanation. There are available many physiologic evident that implies effects of exercise on depression. Certunine and Norepynephrine are two models of these evident (Marco, A.M. and et al, 2005, and Sjoston, N., Kivela, S.L., 2006).

The drugs that use in order to the depression treatment act via changing the performance of the neurons to releasing certunine nervous mediator. These drugs prevent the reabsorbing of the certunine by the neurons; so, direct feedback decreases and the level of certunine increases and the activation of the central nervous system increases. Low level of certunine in people with depression is combined with weakness and these patients go out from their bed difficulty. Currently many human and animal data are available that show the action of the certoneorogic system affects by physical training. Studies on cats have shown that nervous
depletion of the certonine is three pulses in one second but increases to 4-5 pulses following regular physical training. The frequency of these pulses decreases during sleepiness and will be inactive while REM sleeping.

Physical activity leads to increment in certonine in human and animals and decreasing in REM sleeping. The sleeps of the REM is depth, but isn’t relieving as well as sleep by slow wave. Studies have shown that both intensive and prolonged training not only increases duration of the sleeping by slow wave significantly, but also it reduces delaying in sleeping and REM sleeping. In the other hand, those subjects who have physical training, fall asleep sooner, sleep more and have a pleasant sleeping rather than inactive subjects. Increasing in during of sleeping by slow wave following regular exercise leads to increasing in certonine rather than REM sleeping. So, depresses patients can elevate the level of their sertunine by exercise and decrease their REM sleeping (Ohioo, M.K., 2008).

Depression is combined with reduction in norepinephrine synthesis in brain. There isn’t much level of norepinephrine metabolites in urine of depressed people. Drugs that use in order to depression treatment such as Threesyclics and Mono amine oxidize inhibitors, blocks reabsorbing of the norepinephrine in neuron, so increases the level of synapse norepinephrine (Evan, A., 2004). According to these findings and regarding to the positive effects of exercise on depression, it can be concluded that aerobic exercise results in elevating in releasing of sertunine and norepinephrine in depressed people who the level of their hormones are low (Marco, A.M. and et al, 2005).

Maybe, exercise can remove the poison of blood, improves cardiovascular system, increase mental and physical health of the narcotic addicted people. However, financial crime group increase their mental health also, but our results shows that aerobic training have more effect on the mental health of the addicted people in comparison with financial crime people.

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References