

Studying the effects of eight weeks of regular aerobic exercise on public health of male staff in Khuzestan Steel Company

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ABSTRACT: Aerobic exercise appears to be effective in improving mental state and symptoms of Mental patients depression. One of the most effective exercise and physical activity which may have less discussed is the role of exercise in improving public health. This study is aimed to investigate the effect of eight weeks of regular aerobic exercise on public health staff man Khuzestan Steel Company. The population of this study included all non-athletic staffs of the Steel Co (N = 450). For this purpose, 60 samples were selected by simple random sampling (n = 60). They were divided into two experimental and control groups of 30 members. The instrument used in this study included the General Health Questionnaire GHQ-28 to assess the general health of employees and treadmill to measure aerobic capacity. After reviewing the data normality and equality of variances, Data were analyzed using statistical analysis of multivariate covariance to compare the results of pre-test and post-test experimental and control groups. Results showed that the statistical sample can be influenced by aerobic exercise and components of general health (physical symptoms, depression and anxiety) can improve, while no change has been observed in variable of social dysfunction. Regarding the obtained results based on the effectiveness of exercise, especially aerobic exercise in reducing these disorders, it is recommended to all people, especially the Khuzestan Steel staff who are suffering from stress for various reasons that do regular aerobic exercises at least three times a week to reduce these disturbances.

Keywords : Public health, physical symptoms, depression, anxiety, aerobic exercise.

INTRODUCTION

Phenomenon of physical education and sport has attracted everyone's attention as an undeniable necessity and an essential requirement. Creating public and physical health and reducing therapeutic costs for all people are the beneficial effects of this phenomenon. Everyone at any age, both males and females, old or young should do an exercise to benefit from its beneficial effects. Nowadays technology development, lack of exercise and immobility in the present age, which has imposed humans, have caused many mental illnesses and thus compromising their physical and psychological health, particularly in our country. In this critical situation, exercise at a recurring can revive the physical conditions and create mental balance (Tondnevis, 1992). One of the most important effects of exercise and physical activity perhaps less discussed about it, is the role of exercise in improving public health, given the role of physical training, particularly regular exercise (aerobic) which causes readiness of vital systems such as the heart, lungs, muscles, and increases strength and improves energy production systems in muscles and postpones fatigue (Ahmadi, 2005). Several findings support this that exercise can enhance the general health have been conducted by different researchers. For example, the research of Yavarian and Nick Akhtar showed that the females' mental health level in the experimental group significantly improved through aerobic exercise. (Amir Nejad, 2008) also showed that after 8 weeks of training, there was a significant decrease in physical symptoms, depression, the students' social dysfunction, and it causes improving in

their general health. Leforge and Robert, (1999) and McCartney, (2000), showed that that physical activity leads to improve standards of living, including mental disorders, depression, fatigue, and emotional health and etc and it plays an important role in the vitality and freshness of life. So, since the general health is one of the major factors affecting the organizational generality and human relationships, most research in the past 30 years have been dedicated to study the occupational public pressures. It is obvious today that there are many common diseases caused by lack of compromise and creating pressure before it is caused by bacteria and viruses. Public pressure may appear anger, anxiety, sensitivity to the role, futile thoughts and even physical diseases that these factors have devastating impact on confidence and performance. Another reason for attention to the issue of public health is that No person is immune from being infected with the common disease and the common disease knows no exception. In this era, more than ever, people are subjected to nervous- Mental Stress. Everyone have innate tendency to gain respect and acceptance of the other person. If this need is not met person suffers anxiety and stress and In other words he suffers public stress. Therefore, in this study, Researcher is seeking to understand that what level employees with mental disorders who participate in aerobic exercise program (running) compared to employees who do not participate in this program are in terms of this difference, regarding that the exercise is one of the appropriate and effective ways to improve these diseases. According to the mentioned topics, researcher sought to examine the impact of eight weeks of regular aerobic exercise on public health of men workers in Khuzestan Steel Company To clarify whether regular aerobic exercise have an impact on public health?

MATERIALS AND METHODS

Subjects

This research subjects were 60 employees of Steel Company ranging in age from 25 to 30 years who were selected randomly and were assigned to experimental and control groups and each of the groups had 30 people. It should be noted that the subjects were all non-athlete males, and they had no previous history of regular exercise during the past five years (according to their expression in the questionnaire).

Measuring tools

1 - General Health Questionnaire GHQ-28: This questionnaire consists of four subscales. Each of them contains seven questions, which are somatic symptoms, anxiety, social dysfunction and depression. A score is given to each of the four components of the questionnaire and a score is also given to total questionnaire. Thus, this scale gives us five separate score. In terms of responding to questions, Subjects should complete the questionnaire using a five-point Likert scale, according to their health status since one last month to the present. Shahrjerdy et al (2009) used this questionnaire, in a study entitled effect of aerobic exercise on metabolic factors, quality of life and mental health in women with type 2diabete that the reliability of the questionnaire, was $r = \% 92$. Also based on Cronbach alpha coefficient, reliability of questionnaires were obtained $r = \% 87$ in the present study.

2. Treadmill and Pollar stethoscope: Made in Malaysia with Matrix -Tuntori brands. Heart rate at rest and during exercise was measured by Pollar stethoscope. Sensor located in the band of this apparatus was placed on the subject's chest and it was pulled so it does not cause discomfort and inconvenience to the subjects. Stethoscope transmitter automatically started working when it placed on the skin and it sent signals to specific watch. Heart rate was recorded simultaneously on a regular basis in a special form. Aerobic capacity was measured in subjects with this device.

Study design

The present study is a descriptive research that subjects` scores in the pre-test were recorded after filling out the questionnaires, and it was considered as a pre-test score. It should be noted that those who received the highest test scores in public health and they were selected as the statistical sample and they divided to two experimental and control groups.

Measures

Measurement methods and how to work: In this study, the characteristics of the subjects were recorded in individual specification sheets and questionnaires were completed as recorded score by the respondents in the pre test phase. Then selective aerobic exercise program was implemented for 8 weeks. This program included three sessions per week for an hour along with the warm up for 10 minutes, running with intensity of 60 to 75 percent HRR (heart rate reserve) on a treadmill for 20 minutes, 5 to 10 minutes of active recovery, repeating training course for 20 minutes and cool down for 5 to 10 minutes. It should be noted that, exercise times was similar during the program and it was 8 am to 9 pm. (Sharkey Translated by Jhale Doost, Dehkhoda, 2008). At the first, training sessions were to 60 percent of maximal heart rate, and training intensity gradually rose to 75% of maximum heart rate.

Statistical methods

In order to analyze data in this study, the mean and standard deviation were used as descriptive statistics. Before examining the data, KS test was used to assess the normal distribution of the data and Leuven test was used for equality of variances. After reviewing normal distribution of the data and equality of variances, multiple-covariance was used to compare pre-test and post-test results of experimental and control groups. In this method, public health subscale scores of the post-test with the pre-test scores that have been obtained are compiled covariance analysis. Multiple covariance analysis to assess whether there is significant differences among research selected groups in terms of public health, after moderating pre-test scores of public health and post-test scores. The significance level for all statistical analyzes was considered $p < 0.05$.

RESULTS AND DISCUSSION

Table 1 is related to descriptive characteristics of public health variable in both control and experimental groups.

Table 1. The mean and standard deviation status of public health variable in both control and experimental groups

variables	group	stage	Number	Mean	SD
Public health	control	pretest	30	38.82	4.32
		posttest	30	38.14	5.11
	experimental	pretest	30	40.12	3.52
		posttest	30	35.62	3.96

As can be seen in Table, Mean of experimental group from pretest to posttest has decreased and it shows the impact of exercise on public health. Also the impact of exercise on public health components except social dysfunction is positive. (Physical symptoms: the mean of pre-test: 10.54, post-test: 8.11; anxiety, the mean of pre-test: 9.86, posttest: 8.06; social dysfunction: the mean of pre-test: 13.06, posttest: 11.92 and depression: the mean of pre-test: 7.26, posttest: 7.31).

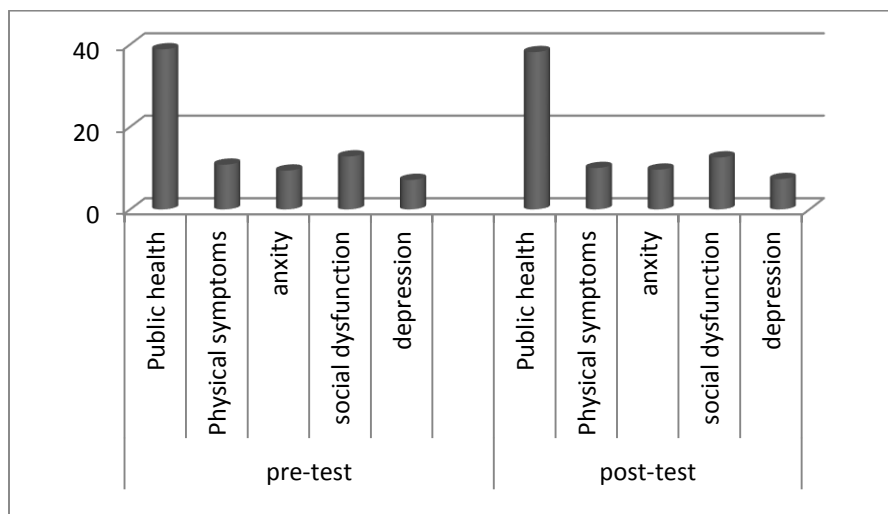
Table 2 is related to the difference between experimental and control groups in terms of general health score.

Table 2. Results of covariance analysis of public health variable between control and experimental groups

Variable	degree of freedom	Mean of	SS	F	P value
Inter group	1	756.45	756.45	93.16	0.000
Intra group	59	611.56	8.12		
Total	60	682.4			

As can be seen in Table 2, according to the test statistic $F = 93.16$ at level $P = 0.000$. There is a significant difference between the two groups in terms of general health. The difference is in favor of the experimental group. Also, a significant difference was observed between the experimental and control groups in the components of physical symptoms ($F = 12.56$, $P = 0.004$), anxiety ($F = 54.15$, $P = 0.000$), depression ($F = 8.07$, $P = 0.011$). But there were no significant differences in the components of social dysfunction ($F = 1.86$, $P = 0.112$). In general, the results showed that there are significant differences between both groups in terms of the components of physical symptoms, anxiety and depression. The difference is in favor of the experimental group. But there were no significant differences in the components of social dysfunction.

To better illustrate the results of the groups, the following diagram are presented.



Discussion

The purpose of this study was to investigate the effect of eight weeks of regular aerobic exercise on general health of staff of Khuzestan Steel Co. The results of this study show, Group who did aerobic exercise have recovered at least in one of the public disorder and the reason for this recovery can be attributed to physiological changes. What is certain is that aerobic exercise could affect the sample and their public health and physical symptoms, depression and anxiety improve. While there was no change in the variable of social dysfunction and not effected can be explained that change in social functioning requires long time that person can find his lost social functioning. Since the time of exercise has not been more than two months, aerobic exercise could not affect on these variable. In explaining the findings of this study and the effect of aerobic exercise on public health, Results of this study are in agreement with the t results of Yavarian and Nick Akhtar, (2008). They examined the effects of aerobic exercise on general health of women in Urmia. And they suggest that aerobic exercise has a positive effect on public health of the group who did aerobic exercise. These results are also consistent with the research of Sardar et al, (2008) who examined the effects of aerobic exercise training on public health, aspects of somatic symptoms, anxiety and insomnia, social functioning and depression in patients with type 2diabete. Also it is consistent with the research Vali Zadeh, (2006) who reviews the impact of 8 weeks aerobic exercise on general health of male students in Shahid Chamran University(depression, anxiety, somatization, social functioning) and study of Shahrjerdy et al, (2009) that examined the effect of aerobic exercise on metabolic factors, quality of life and public health the women with type 2diabete, and they shows that there is a significant difference between the means of pre test and posttest data of public health in aerobic exercise group. Brosnahan et al, (2004) examined the relationship between physical activity and mental health, and they concluded that that physical activity improves health as an important variable. Ivan et al, (2004) in other study entitled providing an effective workout for improving mental health concluded that 24 hours of aerobic exercise is effective in improving mental health. Gaszkow, (2004) in his study showed that aerobic exercise is a major effective factor in reducing depression and anxiety. Harrison et al, (2005) studied the physical activity levels among healthy people in North West England, in relation to important factors of public health. They concluded that the lack of physical activity is linked with poor general health and a maximum of common chronic diseases. Dunn et al, (2001) did experimental and quasi-experimental research entitled amount of physical activity on outcomes of depression and anxiety. Results of this research in the quasi-experimental group showed that intensity of intense, medium and low intensity workout is linked with reduction in depressive symptoms. Also experimental and quasi-experimental groups who did resistance training and aerobic exercise had lower depressive symptoms. Netz et al, (2005) explained the impact of physical activity on health, based on some psychological - social theories. Sagatoun et al, (2005) explained that better social functioning of people who participate in physical activity is that physical activity and exercise increase opportunities for social interaction and develops social skills and also it affects a lot on public health and protecting individuals against depression because of creating the larger social networking. According to many opinions, engage in regular physical activity leads individual to a sense of being skilled and increasing confidence, and increases social supports. According the most forms of general function supports, Social support increases physical and mental health of the person receiving the support. Social support has a variety of effects on the safety of people and their fixing problems, by creating senses of belonging, esteem, approval and admiration, respect and

etc, and overall it can improve general health. Exercise and physical activity that increases vo2 can make desirable social function, by creating this support and interactions.

CONCLUSION

The technique discussed in this paper provides an interactive approach in which the decision maker can search for an acceptable solution of the multi-objective optimization problem. The proposed method to solve multiobjective linear programming problem is better than many existing methods as the concept of bound is used in the iteration.

If we substitute some values to a_i , α_i in multi-objective linear programming problem (3.1), it reduces into single objective LPP. This discussion also holds in the case as given by by Kanniappan and Thangavel (1998). The same problem for integer solution was studied by Bhargava and Sharma (2003).

REFERENCES

- Ahmadi E. 2005. Experimental study of the effect of exercise on mental health of students, movement Journal, No. 28, pp. 29-19.
- Amirnejad. 2008. Investigating the effects of selected exercise training on the social growth and students` public health. The fourth National Seminar of students` mental health.
- Brosnahan G, Steffen LM, Lytle L, patterson G, Boostrom A. 2004. The relation between physical activity and health among Hispanic and non- Hispanic white adolescents white adolescents. Arch Pediatr Adolescent Medicine, 158(8), 818-23.
- Dunn AL, Trivedi MH, O'Neal HA. 2001. Physical activity dose-response effects on outcomes of depression and anxiety. Medicine & Science in Sports & Exercise, 3(6), 587-597.
- Gaszkow SM. 2004. Effect of exercise on anxiety and mood. Department of Psychology, 38(4), 611-20.
- Harrison RA, Eduff McP, Edwards R. 2005. Planning to win: Health and lifestyles associated with physical activity amongst 15,423 adults. The Royal Institute of Public Health Published by Elsevier.
- Leforge RG. 1999. "Stage of regular exercise and health related quality of life ", preventive medicin and international devoted to practice and thory Apr, 28(4).
- McCartney N. 2000. "Roleof resistance training in heart disease", J Med and science in sport and exercise (10) :PP:369-402.
- Milani Far B. 1995. Mental health. sixth edition, Tehran, Arasbaran.
- Netz Y, Meng-jia Wu, Becker J, Gershon T. 2005. Physical activity and psychological well-being in advanced age: A meta-analysis of intervention studies. American Psychological Association, 20(2), 272-284.
- Sagatoun A, Sgaard AG, Bjertness E, Selmer R, Heyerdahl S. 2007. The association between weekly hours of physical activity and mental health: A three-year follow-up study of 15-16-year-old students in the city of Oslo, Norway. BMC Public Health, 7(1), 155.
- Sardar. 2008. Effects of exercise aerobic exercise on mental health aspects of somatic symptoms, anxiety and insomnia, social functioning and depression in patients with diabetes type 2 Department of Physical Education, University of Medical Sciences, Mashhad, Faculty of Physical Education and Sport Sciences, Ferdowsi University, Iranian Journal of Endocrinology and Metabolism, Shahid Beheshti University of Medical Sciences and Health Services, eleventh volume, No 3, pages 256-251.
- Shahrjerdy. 2009. The effect of aerobic exercise on metabolic factors, quality of life and mental health in women with type 2 diabete, Research Journal of Arak University of Medical Sciences, year 12, No. 4, serial number 49.
- Tondnevis F. 1992. Running. Sport for all, Social and Cultural Affairs Office. first edition. Tehran.
- Vali Allah R. 2006. Study of aerobic training on mental health (depression, anxiety, somatization, social functioning) of boy Students in Shahid Chamran University. Master's thesis, Shahid Chamran University.
- Yavarian R, Akhtar M. 2008. Effects of aerobic exercise on psychological health of women in the Urmia, bimonthly .Faculty of Nursing and Midwifery, the ninth volume , No. 1, pp. 52-49.