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# THE EFFECTS OF 12-WEEK AEROBIC EXERCISES ON RATE OF MENTAL HEALTH IN MALE STUDENTS OF AHVAZ PAYAM NOOR UNIVERSITY

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ABSTRACT
**Purpose.** The purpose of this study was to investigate the effects of 12-week aerobic exercises on self-esteem, social desirability and rate of mental health in male students of Payam Noor University (PNU). **Basic procedures.** For this reason we used male college students (n = 80, age = 22 ± 2. 1) who did not do any sport. They were randomly assigned to experimental (n = 40) and control (n = 40) groups, after having been selected via stratified random sampling among students of Ahvaz Payam Noor University. Also, to collect data there were implemented the Cooper test and the general health questionnaire of Goldberg (GHQ) and social desirability questionnaire of Crowne-Marlowe. **Main findings.** Statistical analysis showed that training like aerobic exercises is related to a significant improvement in mental health, self-esteem and social desirability because of favorable changes in some of physiological and psychological parameters. **Conclusions.** This study was of a semi-experimental type (pre-test, post-test). Data analyzed by Multivariate Analysis Of Variance (MANOVA) at p value ($p$ = 0.05) revealed that there were significant differences between experimental group and control group, in mental health, self-esteem and social desirability.

**Key words:** aerobic exercises, self-esteem, social desirability, mental health

## Introduction

Human is a social being and he/she knows his/her value in society but sometimes his/her life and social problems can endanger his/her mental health [1]. Though medical treatments are useful in curing these disorders, also sports activities can be one of the main elements of the treatment. The physiological effect of major exercises (aerobic and non-aerobic) is improving the body form and enhancing the breathing efficiency [2]. Aerobic exercise, which belongs to the long term sport activities, needs oxygen for performance [3]. This kind of exercise activates the systems which provide oxygen to all the cells in the organism, and in this way active muscles receive the oxygen through blood circulation. To establish this kind of aerobic metabolism, the intensity of training should be low, while duration of training should be long [4].

People having a good mental health, have good social relations and relatively healthy lives. Mental health is necessary for happiness and for a quiet life, away from disorders; it helps persons to mix socially with others more easily. However, these social interactions usually breed some conflicts, in many cases these conflicts will threaten the person's mental health so sometimes will produce disorders in the person, such as depression, anxiety and a feeling of social insufficiency [5].

Sports activities, such as aerobic exercises, not only improve the person's physical health, but will affect the mental one. Since physical and mental states are generally related to each other, physical abilities reduction causes a fall in self-esteem sense, which means the person believes in the set of abilities, competence and characteristics of his/her own [6]. With regard to sports activities, they increase self-confidence, efficiency, competence and self-esteem, so they will have considerable influence on optimal performance, educational health, social and psychological health. Therefore, one of the research hypotheses is that a 12-week aerobic training leads to enhancement of the self-esteem in male students. Moreover, sports activities evoke enhancement of the lust for life, improvement in personal and social lives and mental hygiene [7].

Since the person's body determines his appearance and this influence can cause changes in the way one is understood and treated by others, it also has an effect on the person's image of himself. This effect, either of negative or positive direction, causes acceptance, more or less, of himself when his welfare, social desirability and mental health change. Therefore, another research

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hypothesis is that a 12-week aerobic training leads to enhancement of the social desirability and mental health in male students. Social desirability refers to the capacity and ability to accept and bear polarities (bias), conflict opinions and then coordinate your opinions with others'. Social desirability is the resultant of several factors in social psychology such as social influence, social judgment, concerting with others and people's standpoint.

Social desirability forced people to change their behavior according to the society's requirements (conditions) until they were accepted by the society, even if they do not agree with these changes.

Since going in for sport is one of the best and most effective methods to decrease the psychological problems, and it is also closely related to psychological characteristics of an individual, in this study we investigated whether a 12-week aerobic training affects the rates of self-esteem, social desirability and mental health in male students of Payam Noor University (PNU).

**Material and methods**

All participants in this research were students of Payam Noor University in Ahvaz city in the year 2008. 80 male students who had had no regular exercise for at least 2 months were selected to this study. The subjects were selected as random sampling, then divided into two groups (experimental group $n$ = 40; and control group $n$ = 40). Having been familiarized with the exercise procedure, all subjects (control and experimental groups were asked to do a performance test (pre-test), and then the experimental group followed the aerobic exercise program for 12 weeks – 3 sessions in a week and each session lasted 40 minutes.

After four weeks and having establishing a relative adaptation of the subjects to physical activity, the exercise intensity was increased. The protocol of an aerobic practice session was as follows:

1. Warm-up (7 minutes).
2. Original (initial) activity.

A: The subjects run for 10 minutes with 65% of maximal heart rate.
B: Rest (5 minutes) while walking and jogging.
C: The subjects run for 8 to 12 minutes with 65% of maximal heart rate, again.
D: Active rest (3 minutes).

3. Cool-down (5 minutes).

In this study we used the Cooper Smith scale of self-esteem to measure the rate of self-esteem. This scale, contains 58 questions and it is as self-report pencil-paper where question numbers: 6, 20, 13, 27, 34, 41, 48 and 55 are a polygraph test. The reliability coefficient was obtained by associating the scores with the criterion questions, whereas the gained validity coefficient was 39%, which was significant ($p < 0.05$). Also the calculated reliability coefficients by Cronbach's alpha and split-half methods were respectively 0.87 and 0.77.

To evaluate the social desirability we used the Crowne-Marlowe scale. In this scale subjects had to answer: true or false (Ratus scale). To calculate the validity of this scale we used Cronbach's alpha and split-half methods; the coefficients were 0/83 and 0/64, respectively, and were acceptable. To measure the level of mental health we used general questionnaire (GHQ) – a 28-question form. This questionnaire designed by Goldberg and Hiller has been translated into different languages so far.

In the current study, the validity coefficient of this questionnaire which was found by associating Cronbach's alpha method with SCL-90 test was 0.84 and also the reliability coefficients were 0.97 and 0.93.

**Results**

Descriptive findings in this study included the statistics indexes such as average, standard deviation, minimum and maximum score. All of them are shown in Tables 1, 2 and 3.

As the data in Tables 1 and 2 show, the averages of self-esteem and social desirability increased after exposure to the independent variable (aerobic exercise).

We need to explain that a small difference in the experimental group compared to the control group indicates an increase in self-esteem and social desirability. **The lower the score, the higher the value of the test variable.**

Table 3 shows average, standard deviation, minimum and maximum scores (experimental and control groups) before and after aerobic exercises. As Table 3

Table 1. Scores of self-esteem in experimental and control groups

| Variable | Stage | Group | Statistical indexes | | | | |
|---|---|---|---|---|---|---|---|
| | | | Mean | SD | Min | Max | $n$ |
| Self-esteem | Pre-test | Experimental | 31.25 | 13.41 | 10 | 48 | 40 |
| | | Control | 23.12 | 13.97 | 5 | 48 | 40 |
| | Post-test | Experimental | 42.30 | 16.97 | 0 | 48 | 40 |
| | | Control | 22.68 | 13.54 | 5 | 46 | 40 |
| | Difference | Experimental | –11.05 | 18.61 | 0 | 36 | 40 |
| | | Control | 0. 44 | 9.01 | –16 | 20 | 40 |

Table 2. Scores of social-desirability in experimental and control groups

| Variable | Stage | Group | Statistical indexes | | | | |
|---|---|---|---|---|---|---|---|
| | | | Mean | SD | Min | Max | n |
| Social-desirability | Pre-test | Experimental | 19.12 | 4.45 | 9 | 29 | 40 |
| | | Control | 16.10 | 3.96 | 5 | 10 | 40 |
| | Post-test | Experimental | 20.88 | 6.71 | 13 | 28 | 40 |
| | | Control | 15.61 | 3.49 | 5 | 10 | 40 |
| | Difference | Experimental | –1.76 | 7.61 | 0 | 8 | 40 |
| | | Control | 0. 49 | 4.01 | –14 | 2 | 40 |

Table 3. Scores of mental health in experimental and control groups

| Variable | Stage | Group | Statistical indexes | | | | |
|---|---|---|---|---|---|---|---|
| | | | Mean | SD | Min | Max | *n* |
| Mental health | Pre-test | Experimental | 36.30 | 11.44 | 10 | 56 | 40 |
| | | Control | 23.12 | 11.96 | 5 | 56 | 40 |
| | Post-test | Experimental | 16.82 | 18.93 | 0 | 54 | 40 |
| | | Control | 26.68 | 11.49 | 5 | 52 | 40 |
| | Difference | Experimental | 19.48 | 16.61 | 0 | 46 | 40 |
| | | Control | –3.56 | 6.01 | –17 | 20 | 40 |

shows, the value of the mental health in experimental group decreased, which indicates an improvement in mental health. We need to explain that high score in the experimental group compared to the control group indicates that some problems of mental health have decreased. **The higher the score, the lower the value of the test variable**

Statistical analysis was conducted using SPSS version 12.0 for Windows. The data were analyzed by multiple comparison tests (MANOVA) and the results are shown in Tables 4 to 6.

As Table 4 indicates there is a significant difference between the experimental and control groups in self-esteem ($F$ = 122.80, $p$ = 0.0001), mental health ($F$ = 94.82, $p$ = 0.0001) and social desirability ($F$ = 122.80, $p$ = 0.0001).

In other words, aerobic exercises in both groups lead to an improvement in self-esteem, social desirability and mental health.

As Tables 6 and 7 indicate there is a significant difference between the experimental and control groups in mental health variables (including physical syndromes, anxiety, depression and disorder in social performance). In other words, aerobic exercises will cause a decrease in physical syndromes, anxiety, depression and also in disorders of social performance.

Table 4. MANOVA on difference in self-esteem, social desirability and mental health

| Test name | Value | Approx. F | Significance |
|---|---|---|---|
| Pillai | 0.982 | 74.25 | 0.0001 |
| Walk's lam | 0.347 | 74.25 | 0.0001 |
| Hotelling | 2.59 | 74.25 | 0.0001 |
| Roy's | 3.28 | 74.25 | 0.0001 |

Table 5. The results of effects between subjects

| Variables | Sum of squares | Mean square | *F* | Significance |
|---|---|---|---|---|
| Self-esteem | 1426.03 | 1426.03 | 93.86 | 0.0001 |
| Social desirability | 1298.26 | 1298.26 | 122.80 | 0.0001 |
| Mental health | 1327.04 | 1327.04 | 94.82 | 0.0001 |

Table 6. MANOVA on difference in variables of mental health

| Test name | Value | Approx. F | Significance |
|---|---|---|---|
| Pillai | 0.483 | 25.48 | 0.0001 |
| Walk's lam | 0.517 | 25.48 | 0.0001 |
| Hotelling | 0.934 | 25.48 | 0.0001 |
| Roy's | 0.934 | 25.48 | 0.0001 |

Table 7. The results of effects between subjects

| Group | Mean | Variables | Sum of squares | Mean square | *F* | Significance |
|---|---|---|---|---|---|---|
| Exper | 5.44 | Physical syndrome | 734.57 | 734.57 | 74.42 | 0.0001 |
| Con | –1.18 | | | | | |
| Exper | 4.98 | Anxiety | 810.83 | 810.83 | 70.41 | 0.0001 |
| Con | –0.82 | | | | | |
| Exper | 4.10 | Disorder in social performance | 951.92 | 951.92 | 86.03 | 0.0001 |
| Con | –1.23 | | | | | |
| Exper | 6.02 | Depression | 698.16 | 698.16 | 61.15 | 0.0001 |
| Con | –0.71 | | | | | |

## Discussion

The investigation studied the effect of 12-week aerobic and resistance exercises on the improvement of mental health. The results showed that in comparison with the control group, after 12 weeks the control group showed a significant improvement in mental health, vitality, public health (general health), the level of physical pain, general body function, depression, physical stress and social desirability [8].

Dehart et al. [9] in their study found some relations between the self-esteem and sports performance. As was predicted there is a relationship between a higher

self-esteem and a better sports performance. Higher self-esteem, social desirability and the better sport performance are related with the higher positions as well as more money (wealth) and a lower level of job stress, also an athlete with high self-esteem used a little bit information for negative performances in the past.

In the research done by Dishman et al. [10], the issue analyzed was whether there is a relationship between physical activities, imaging of oneself and self-esteem and signs of depression or even its permanent state in the population of 1250 girls in the 12th grade school (average age 15.6 years). The results showed a strong and positive relationship between self-imaging, physical activities and self-esteem: moreover, they showed a significantly negative relationship between self-esteem and signs of depression.

In the research done by Jago et al. [11], it was shown that social desirability was related to the physical activity and aerobic exercises positively. Also there was significant and positive relation between sedentary lifestyle and negative self-conception.

Klein and his colleagues [12] in their research, investigated 74 depressed patients for 12 weeks who were divided into three groups: track and field group, the medical treatment group and medicine group. The findings showed that physical exercises improved rates of mental health more efficiently than medical treatment and medicine. The researchers continued this study for at least 1 year.

Knechtle [13] in a research in mental patients reached the conclusion that endurance training like resistance training has an effect on improving public health (general health) and psychological comfort. In athletes and in patients with psychological problems, especially in depressed patients, the physical activity decreases symptoms of syndrome [13].

Atlantis et al. [8] in their work concluded that 12-week aerobic and weight trainings are useful to improve the mental health.

Guszkowska in her research [14], analyzed the effect of aerobic trainings on the above factors and concluded that aerobic trainings including jogging, swimming and running with the medium or high intensity for 15 to 30 minutes and 3 sessions in a week will lead to a decrease in depression, anxiety and an increase in self-esteem.

O'Connor et al. [15] found in one of their studies that physical activity, including aerobic exercises, is the best way to reduce depression and increase the social desirability. Van den Berg et al. [16] dealt with two groups, control and experimental, of respectively 16 and 18 men. They came to the conclusion that a three-month aerobic training led to better quality of social life and more active life in experimental group. Moreover, this group had more social desirability and more self-esteem.

**Conclusions**

Based on the findings of this study, 12-week aerobic exercises will increase the self-esteem in male students. This result is consistent with the findings of Dishman et al. [10] Guszkowska [14], Van den Berg et al. [16].

To explain the findings of the present theory we can state that performing exercise such as aerobic exercises has an effect on a series of physical and psychological factors, and thus, results in an increase in people's self-satisfaction. Certainly, many of these variables, like the improvement in physical and psychological health, have a direct relation with self-esteem.

It seems that there is more self-consciousness along with the increasing self-esteem. Sport exercises give a sense of skill, ability and control that leads to an increase in the self-esteem in people. On the other hand, in the current study it was seen that 12-week aerobic exercises have increased the social desirability of male students. The results of this theory are consistent with the findings of Atlantis et al. [8], Jago et al. [11], O'Connor et al. [15], Van den Berg et al. [16].

Along with the increasing self-esteem, the person can express his thoughts and feelings straightforwardly and earn respect for himself, and on the other hand, he will respect desires and needs of others. Physical health as a result of exercises, following the mental health, gives a sense of self-efficiency and internal control to human (self-control) and also these feelings will strengthen the self-esteem and self-confidence in the mutual relations with others. As a result, the person will find really satisfactory interpersonal relations. When the person finds people who can satisfy his needs he will not close to others with fear of being hurt or controlled by others. Therefore, the person can find the ability to accept and to endure contrariness, unfavorable opinions, and consequently, will learn how to cope with others.

Also according to the findings of this research, it was clear that 12-week aerobic exercises lead to an improvement in the mental health and a decrease in all the values of its variables in male students. This result is consistent with Atlantis et al. [8], Klein et al. [12], Knechtle [13], Guszkowska [14].

Since positive mood is created by some of neurotransmitters such as dopamine and serotonin, it implies that the main reason for positive effects of sport training on mood is probably releasing endorphins through the

continuous efforts that produce a kind of elation, which is known as the "runner's elation". Para morphine and endorphin materials make athletes not feel the pain caused by injuries and fatigues, which occur while doing sport and who get confidence due to physical exercises. In fact, athletes will give wage from chemical created state. Another reason for positive mood in athletes is that there are social pleasant interactions in an environment of uniformity where people do physical activities and sport either individually or in a team.

Generally, we explained that sport and physical activity including aerobic exercises lead to higher self-confidence and more positive one's body imaging. Probably, the main reason for the effect of physical exercises on mental health is the undeniable influence of attitudes and positions of people on the positive mood that is created by endorphins, social achievements and reduction in tension and depression.

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