A Study and Comparison of the Effect of Team Sports (Soccer and Volleyball) and Individual Sports (Table Tennis and Badminton) on Depression among High School Students

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Abstract: The present research studies and compares the effect of participating in team sports (soccer and volleyball) and individual sports (table tennis and badminton) on depression among high school students of Khoramdareh City in the period of 2006-2007. Research method is semi-empirical and the population of the research includes 1300 high school students of which 100 students with depression (ranging from borderline to severe) were chosen using Beck Depression Inventory and were randomly divided into five homogeneous groups (soccer, volleyball, table tennis, badminton and a control group). The four experimental groups participated in sports activity for eight weeks, three sessions per week and each session lasting for 1 hour and 15 minutes and subjects in the control group were prevented from performing any regular sports activity. At the end of eighth week, they took the depression test for the second time. After collecting the data and analyzing them using correlated and independent t-tests and one-way ANOVA, the results showed that sports activity reduced depression in subjects (at the significance level of \( \alpha = 0.05 \)) and that the effect of team sports (soccer and volleyball) on reducing depression is greater that the effect of individual sports (table tennis and badminton).

Key words: depression, effect, sports activity.

INTRODUCTION

Human knowledge is advancing in all areas and various sciences are progressing and are growing broader and broader; physical education and sports sciences are not an exception. Physical education is a phenomenon that all the people in the society, especially the younger generation, need it and can benefit from its valuable rewards. Now if this phenomenon is integrated with a series of scientific ideas, concepts and achievements, it will certainly have a greater effect (Azadehfar A., 2008).

In order to introduce this science in society, studies have to be carried out in the area of physical education, especially with regard to its various historical, medical and psychological aspects. One of the areas of research is sport psychology which, especially in the last two decades, has attracted increasing attention and is more than any time presented in the sports arena of the world; it is taught in many universities and has been the subject of many studies and as a result, the myriads of findings regarding human behavior and their sport performance has added to the wealth of the knowledge of this field.

Psychopathy and in particular, depression, is a phenomenon that accompanies industrialization in societies. As countries move away from the traditional to being developed and industrialized, contagious and infectious diseases give way to psychological disorders and cardiovascular diseases (which are again affected by psychological disorders). These diseases afflict lots of individuals, especially in the current conditions of society, and deprive them of opportunities which is irremediable (Azadehfar A., 2008).

Depression is a disorder that is very much prevalent in most societies, in particular among students, and can totally deprive them of golden opportunities for progress, career and a promising future. The necessity to train students who insure the future of a society calls for our attempt to treat or decrease their emotional and psychological disorders. One of the methods that can influence the depression of students is participating in sports activities; for sports activities have a special place among students and several studies have compared depression level in athletes and those who participate in sports activities in comparison with non-athlete groups.

Although there have been research studies regarding the relationship between sports and depression, tangible assessment of the effect of sports on depression requires more work and there are always many questions in this regard: can a specific sports activity affect depression? Do various physical activities have similar effects on depression or are the effects different?

Physical education and sports are of the necessities of contemporary life. Moreover, it is a knowledge whose roots can be found in different sciences and it benefits from various forms of knowledge. It is therefore essential for all professions and specialties in the area of physical education to become aware of various aspects and the extraordinary value of physical education and to realize its role in the changing society (Ramezani F., 2007).
There are always vicissitudes in the life of modern human beings and many changes occur during this journey of life and depending on various situations, they show specific responses. Thus, environment can be as individual desires and result in their fortune and bliss or it may be otherwise, inhibiting the development of their self-confidence and leading to despair and many psychological problems (Ramezani F., 2007).

The field of physical education, due to its broad range of principles and due to being a newcomer, especially in Iran, involves many issues and obscurities that need to be researched on. Of the issues discussed within this field are its psychological bases which deal with one of the existing problems of many societies, especially among students who are like a schema of the culture of a country. Considering the above issues, this research is carried out to answer the question whether team sports (soccer and volleyball) or individual sports (table tennis and badminton) can have any significant effect on the depression of high school students of Khoramdareh City during the period 2006-2007. If the answer is yes, is there any significant difference between the effects of these two types of sports on the depression level of these individuals?

The progress of any society depends on the younger generation, specifically students, who build the future of that society. Nowadays, adolescents and youths can contribute to the future destiny of a country only if they are physically and psychologically healthy. On the other hand, mental health is meaningless without physical health for “a sound mind is in a sound body”; therefore, having a healthy body is a necessity for having a healthy mind.

Regarding the importance of this research we have to take into consideration the importance of the role of physical education in the lives of people. In any area of science, scientists are trying to come up with new findings and to add to the practice scope of that science. Physical education too is being increasingly introduced in societies and is about to find its true stance among other sciences; yet, for a better presentation of this field in the society, physical education programs must be examined and as well its various roles and effects must be assessed and analyzed.

On the other hand, depression is one of the temperament problems and is becoming more prevalent day by day. Thus, considering its negative effects on the spirit and psyche of individuals which may even go so far as to make them “commit suicide”, the necessity to reduce depression level of people is evident. Many methods have been introduced and applied by psychologists and researchers for dealing with this problem. Physical education and sports activities are of methods that have been applied much more since 1980. However, its effectiveness has to be proven through many research studies carried out among different populations. Thus, the purpose of this research is a relative elevation of the practical aspect of studies carried out in this area and is important in that by conducting two types of sports, i.e. team sports (soccer and volleyball) and individual sports (table tennis and badminton), and by taking into account a control group, this research will to some extent clarify the effects of these activities on depression level; so if the effect of these activities on depression of the high school students of Khoramdareh City is verified, there may be studies in a broader range of student populations and in other regions, which will add to the value of sports in the society and the field of physical education will be given more attention. The research will reveal whether or not there is a difference in the effects of these four sports on high school students who are at the critical point of choosing their future career and destiny. Coaches, psychologists and parents can, with more awareness, guide students to participate in a specific team or individual sport and the significance of sports as an inexpensive and cherished method will attract more attention.

Research Methodology:

The research method is semi-empirical with a pretest-posttest design and with a control group. After performing the pretest, each of the four 20-subject groups participated in sports activities (soccer, volleyball, table tennis and badminton) for eight weeks, three sessions per week and each session lasting for one hour and fifteen minutes. 20 subjects in each of the experimental groups (soccer, volleyball, table tennis and badminton) participated in the activities and during this period, the control group was prevented from performing any kind of sports. After eight weeks, all the five groups (four experimental groups and a control group) were again tested using Beck Depression Inventory.

Statistical Population:

The statistical population of the research included high school students of Khoramdareh city who were studying in the period of 2006-2007.

Statistical Sample and Sampling Method:

Sampling was of stratified random type; Beck Depression Inventory as well as personal specifications questionnaire was distributed among individuals and after analyzing the data obtained from questionnaires, 100 individuals who had depression (from borderline depression to severe depression) and according to their written statements had no special diseases and no record of continuous and regular exercise were chosen and randomly divided into five groups of 20 subjects; 20 subjects in the first experimental group (soccer), 20 in the second
experimental group (volleyball), 20 in the third (table tennis), 20 in the fourth (badminton) and 20 in the control group. The depression level of samples in all groups ranged from borderline depression to severe depression and there was homogeneity between the mean depression scores of the five groups.

Material:
The measurement tool in the present research is Beck Depression Inventory which has been translated by Ahmad Ahmadi and applied and normalized in Iran (Azadehfar A., 2006). This test contains 21 questions which altogether assesses 21 aspects of depression.

Statistical Methods:
In this research, one-way ANOVA has been applied to compare the means of the five groups and correlated and independent t-tests have been used to compare the results of pretest and posttest. Moreover, descriptive analysis has been used to obtain core indices (mean, median and mode), index of dispersion and standard deviation; all statistical operations (descriptive and inferential) were performed by computer.

Results:
In this section, we present a summary of the research, the obtained results and discussion and conclusion. We also present the recommendations issuing from the research and provide researchers with some suggestions.

The purpose of this research was to analyze and compare the effects of team sports (soccer and volleyball) and individual sports (table tennis and badminton) on depression of students. In the present research, the researcher aimed to achieve the following objectives:
1. Determining depression level of high school students of Khoramdareh City before and after participating in an eight-week sports activity
2. Comparing the depression level of these students before and after participating in team sports (soccer and volleyball) for eight weeks
3. Comparing the depression level of these students before and after participating in individual sports (table tennis and badminton) for eight weeks
4. Comparing the effects of team sports and individual sports with one another

The research method is semi-empirical with a pretest-posttest design and with a control group. The statistical population of the research included high school students of Khoramdareh City who were studying in the period of 2006-2007; some high schools were randomly chosen and 100 individuals who were qualified to participate in the research – who had depression (ranging from borderline to severe depression) and had no record of regular participation in sports activities – were selected as sample; the subjects expressed their satisfaction to participate in the study. These individuals were randomly divided into 5 homogeneous groups of 20 subjects and the independent variables (soccer, volleyball, table tennis and badminton) were applied randomly; each group participated in sports activities for 96 sessions, each session lasting one hour and fifteen minutes.

The measurement tool was Beck Depression Inventory. Subjects could obtain a score from 0 to 3 for each aspect of depression. In each part of this test, choices were ordered in a way that if the subject marks choice 1, their score will be zero for that aspect, choice 2 had the score of 1, choice three has the score of 2 and choice 4 has the score of 3. After finishing the exercise sessions, subjects took the posttest. The statistical methods applied include one-way ANOVA and independent and correlated t-tests. The results are as follows:

1. Team sports (soccer and volleyball) have no significant effect on the depression level of high school students

| Table 1: Distribution of indices of depression level in the pretest and the posttest for individuals participating in team sports (soccer and volleyball). |
|-------------|--------|--------|--------|--------|--------|--------|
| Index (Level) | No. | Mean | SD     | DOF   | Obtained t | P     |
| Pretest      | 40   | 20.65 | 5.74479 | 39     | 9.803   | 0.000 |
| Posttest     | 40   | 12.7  | 4.5419  |        |          |       |

* Significance level: P < 0.05

As seen in table 1, considering the mean scores of the pretest and the posttest for team sports and by comparing the obtained t value and the value of t in the table (with 95%CI and P < 0.05), we can infer that the depression level of students significantly changed after eight weeks of participation in team sports (soccer and volleyball); these changes signify reduction and they are statistically significant. The table value of t is less than the calculated value of t (2.021 < 9.803, P < 0.05, DOF = 39).
Chart 1: Comparing the mean depression scores of the pretest and the posttest for team sports group.

2. Individual sports (table tennis and badminton) have no significant effect on depression level of high school students.

Table 2: Distribution of indices of depression level in the pretest and the posttest for individuals participating in individual sports (table tennis and badminton).

<table>
<thead>
<tr>
<th>Index (Level)</th>
<th>No.</th>
<th>Mean</th>
<th>SD</th>
<th>DOF</th>
<th>Obtained t</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pretest</td>
<td>40</td>
<td>20.2</td>
<td>6.865</td>
<td>39</td>
<td>9.374</td>
<td>0.000</td>
</tr>
<tr>
<td>Posttest</td>
<td>40</td>
<td>15.2</td>
<td>4.822</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* Significance level: $P \leq 0.05$

As seen in table 2, considering the mean scores of the pretest and the posttest for individual sports and by comparing the obtained $t$ value and the value of $t$ in the table (with 95% CI and $P \leq 0.05$), we can infer that the depression level of students significantly changed after eight weeks of participation in individual sports (table tennis and badminton); these changes signify reduction in depression and they are statistically significant. The table value of $t$ is less than the calculated value of $t$ ($2.021 < 9.374, P < 0.05, DOF = 39$).

Chart 2: Comparing the mean depression scores of the pretest and the posttest for individual sports group.

In order to control the effect of other variables on the tests, to see whether or not other variables influence depression level, and to support test results it was necessary to give pretest and posttest to a number of students without assigning them to perform any sports activities; thus, we also analyzed depression level of the control group.

Table 3: Distribution of statistical indices of correlated $t$-test between the mean score of pretest and posttest for the control group.

<table>
<thead>
<tr>
<th>Index (Level)</th>
<th>No.</th>
<th>Mean</th>
<th>SD</th>
<th>DOF</th>
<th>Obtained t</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pretest</td>
<td>20</td>
<td>20.6</td>
<td>5.75</td>
<td>19</td>
<td>1.782</td>
<td>0.109</td>
</tr>
<tr>
<td>Posttest</td>
<td>20</td>
<td>18.9</td>
<td>5.87</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* Significance level: $P < 0.05$

As seen in table 3, mean scores of the pretest and the posttest for the control group is 20.6 and 18.9 respectively. Although the scores have changed, considering findings about the calculated value of $t$ and by comparing it to the value of $t$ in the table (with $p < 0.05, DOF = 19$), we infer that the difference between the two mean scores is not significant; the calculated value of $t$ is 1.782 which is less than the table value of $t$ which is 2.093, signifying that the difference is not significant, i.e. no other variable has affected the reduction of depression level in the subjects of this group.
Chart 3: Comparing the mean depression scores of the pretest and the posttest for the control group.

3. There is no significant difference between the depression level of the experimental groups and the control group.

Table 4: Distribution of indices of the correlated t-test for the third hypotheses.

<table>
<thead>
<tr>
<th>Index (Level)</th>
<th>No.</th>
<th>Mean</th>
<th>SD</th>
<th>DOF</th>
<th>Obtained t</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>Posttest of the control group</td>
<td>80</td>
<td>18.9</td>
<td>5.75</td>
<td>79</td>
<td>8.671</td>
<td>0.000</td>
</tr>
<tr>
<td>Posttest of the Experimental groups</td>
<td>80</td>
<td>13.86</td>
<td>4.8</td>
<td>79</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* Significance level: \(P < 0.05\)

As seen in table 4, mean score of the posttest of the control group and the experimental group differ; since the calculated value of \(t\) is more than the table value of \(t\) (with 95% CI and \(P < 0.05\)), we can infer that the depression level of individuals has changed after participation in eight weeks of sports activity and this change is marked by reduction in the depression level. The table value of \(t\) is less than the calculated value of \(t\) (1.98 < 8.671, \(\alpha = 0.05\), DOF = 79).

Chart 4: Comparing mean depression scores of the control group and the experimental groups in the posttest level.

4. There is no significant difference between the effect of team sports and the effect of individual sports on depression

Table 5: Distribution of indices of the t-test for the amount of change in the depression level of team sports group (soccer and volleyball) and the individual sports group (table tennis and badminton).

<table>
<thead>
<tr>
<th>Index (Level)</th>
<th>No.</th>
<th>Mean</th>
<th>SD</th>
<th>DOF</th>
<th>Obtained t</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>Posttest of the control group</td>
<td>40</td>
<td>7.95</td>
<td>5.13</td>
<td>79</td>
<td>3.39</td>
<td>0.002</td>
</tr>
<tr>
<td>Posttest of the Experimental groups</td>
<td>40</td>
<td>5.28</td>
<td>3.56</td>
<td>79</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* Significance level: \(P < 0.05\)

As seen in table 5, mean decrease of depression level in the team sports group differs from that of the individual sports group; considering the calculated value of \(t\) and the table value of \(t\) (with 95% CI and \(P < 0.05\)), we can infer that there is a significant difference between the effect of team sports and individual sports on depression level and statistically, the effect of team sports on depression level is greater than the effect of individual sports; this effect signifies more reduction of depression level in team sports in comparison with individual sports and it is statistically significant. The table value of \(t\) is less than the calculated value of \(t\) (2.021 < 3.39, \(\alpha = 0.05\), DOF = 39).
Chart 5: Comparing mean changes of depression level in the pretest and posttest of the three groups.

Discussion:

To sum, the results of this research regarding the effect of sports and physical activities on depression level are consistent with the results of Doyne, Ossip-Klein, and Bowman et al. (1987) who compared the effect of aerobic and nonaerobic exercise on the treatment of clinical depression in their research titled “Running versus weight lifting in treatment of depression” (Doyne E, Ossip-Klein DJ, Bowman ED, Osborn KM McDougall-Wilson IB & Neimeyer RA 1987); with Chambless and Beutler (1983) who carried out a research on the effect of cycling on depression (Doyne FJ, Chambless DL & Beutler LE 1983); with Palmer et al. (1995) who studied the effect of three types of exercise on depression with the results of the research of Steptoe et al. (1989) on the effect of aerobic fitness in reducing anxiety, depression and other moods and the other research of Steptoe et al. (1993) on the effect of conducting moderate aerobic exercise on depression and anxiety with the studies of McCann and Holmes (1984) and Freemont and Craighead (1987) who studied the effect of a ten-week aerobic exercise program on depression with the research of Martinsen, Hoffart and Solberg (1989) who studied the effect of aerobic and nonaerobic exercise on depression in two different groups with the studies of Mohammadnejad (2005) and Azadehfar (2006) on the effect of aerobic exercise on reducing depression of adolescents (15-18 years old) with the research of Hamiditabar (2003) and Dongpayee (1996) who compared the dispersion of depression in team and individual sports with the research of Mehdipour on the effect of individual and team sports (soccer, volleyball, table tennis and badminton) on reduction of depression with Buchman et al. (1991) on the relationship between physical activity and depression and with Lisa Cooper-Patrick et al. (1997) who studied the relationship between exercise and depression and with Martinsen (1990) on the increase of aerobic fitness and its effect on depression.

Yet, our results are inconsistent with the research of Antonio Diano (1985) on male and female athletes and non-athletes with Beathea (1995) on the effects of various training methods on mood states with the research of Ramezani (2007) on the effect of aerobic fitness on depression among adolescents (15-18 years old) with the research of Khalaji (2001) on personality traits of endurance athletes in adolescent and adult age groups and in comparison with normal groups and with Taheri (2001) who analyzed and compared depression and trait anxiety of elite female athletes in the individual sports of track and field and swimming with team sports of volleyball and basketball.

Regarding the comparison of the effect of different types of sports on depression, our results is consistent with the research of Caruso and Gill (1986), Doyne et al. and Wilson (1987), Hoffart, Martinsen and Solberg (1989) who conducted aerobic and nonaerobic exercises in two different groups, Hamiditabar (2003) who compared the dispersion of depression in team and individual sports, and Mehdipour on the effect of individual and team sports on depression. Yet our results are inconsistent with the research of Palmer et al. (1995) and Dongpayee (1996).

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