

The Relationship Between Scoliosis and Depression and Anxiety in Male Athlete and Non-athlete Students of Selected Universities of Tehran

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Abstract: The goal of the present research was to study the relationship between scoliosis and depression and anxiety in male athlete and non-athlete students. To attain this, the researcher used Beck Depression Inventory and self-rating questionnaires (state-trait anxiety) as well as a system for measuring scoliosis in order to determine the variables. This research was carried out on 300 male athlete and non-athlete students of universities of Tehran. Firstly, using spinal mouse system, the degree of scoliosis of subjects was determined. Then, the foresaid questionnaires were distributed among samples. Sampling was of cluster type; three universities were selected (University of Tehran, Allameh Tabatabaee University and Physical Education Faculty of Islamic Azad University Central Tehran Branch) and 94 students with scoliosis more than 10 degrees were selected. The research type was field-descriptive. We used Pearson's coefficient correlation in order to assess correlation and significance and performed Fisher's test to compare the athlete and non-athlete groups. The results showed that there is no significant relationship between scoliosis and depression and anxiety in athletes and non-athletes.

Key words: Spinal mouse, scoliosis, depression, anxiety.

INTRODUCTION

In recent decades, there have been great advancements in psychology and corrective exercises and these concepts have been regarded a lot more than before. Nowadays, in countries renowned in sports, these fields play an important role both in function and in research. Corrective movements are of the important branches of physical education that deal with correcting postural deformities and after recognizing the type of deformity, they try to treat the deformity by recommending physical activities and special sports exercises.

The conditions of spine, like other body parts, follow the principles that govern human body. This column that forms the central axis of human body extends from the skull base to the small of the back and is made up of a series of vertebrae that are set upon one another and are connected by means of sinews and fibrous-cartilaginous discs (Daneshmandi, 2004).

Deformities of the spinal column are usually manifested as scoliosis, kyphosis, and lordosis. Transformation of different parts of spinal column leads to deviation in bones and commissures based on where they are located. For instance, weakness of anterior part of vertebrae and back muscles leads to kyphosis and lateral and irregular curvature of vertebrae leads to scoliosis. The most prevalent of these deformities is scoliosis; kyphosis and lordosis come later (Alizadeh *et al.*, 1999).

Temporary scoliosis is caused by imbalance or weakness of muscles around spinal column which can be reflexive or due to specific body postures. Usually scoliosis manifests before the age of 14 and its prevalence is 1.9%. In radiological examination of patients it was shown that about 2.3% are postural, 1.4% idiopathic and the remaining 10% are congenital (Kasehf, 2001).

Scoliosis is a disease and can be analyzed from a medical perspective. Its cause is not exactly known, but congenital factors are important in its development. These anomalies are more prevalent in girls (85% of patients are girls). Scoliosis may develop in dorsal or dorsal-lumbar area, but the most prevalent cases are in dorsal area with curvature to the right (Sokhangouee, 1999).

Depression is a state of temperament which is defined by a sense of incompetence, despair, decrease of activity or reaction, pessimism, melancholy and related symptoms. In this concept, depression is completely normal, relatively short-term and recurrent (Mohammadzadeh, 2002). Depression is a normal human reaction against life stresses such as failure in education, losing a job, losing a beloved or awareness of the fact that disease or old age diminishes potency.

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These are some of the situations that lead to depression. Bergman has stated that depression is a general discontent not only seen among psychological patients but also among a large number of people and in common terms, it refers to any kind of unpleasant feeling including sadness, apathy or even anger.

Considering the relationship and effect of body and mind on one another, Leman (1960) stated that sports and physical exercises affect mental health and relying on this fact, claimed that physical ability will support mental ability (Mohammadzadeh, 2002).

Anxiety is a state of independent provocation followed by feelings and mental perception; thus, anxiety has biological and mental aspects and they are both to some extent realized in the anxious individual (Yathrebi,).

Harris and Dorothy believe that anxiety has both general and cognitive (mental) realizations and every time a person worries about situations like exams, meeting important people, attending activities and events, they become anxious. This anxiety does not happen only in the person's mind, rather the whole body becomes anxious and the resulting reactions occur through the whole body. Through some signals, the human body notifies us that we are out of control (Bageheri Ragheb, 1991).

Anxiety in sport competitions constitutes an important part of sports psychology. In physical education, the relationship between matter and mind is reflected in sports psychology. Usually, sports psychology includes two concepts: improving performance and mental health. Improving sports performance is related to the psychological factors of performance and includes anxiety, focus, mental preparation and personality. These factors have direct relationship with sports performance (2); that is, as sports performance or skill performance may invoke anxiety, anxiety may have reciprocal effect on individual's level of performance (8).

Andrew Hendrik (2006) carried out a research on 10-year-old students in South Africa and children having scoliosis were screened using Adam's Position and Erect Position tests. The results showed that scoliosis is more prevalent in primary schools and children who live under poorer economic conditions have a higher level of scoliosis than others (9).

Tons Megan *et al.* (2006) carried out a research titled "A Review of Quality of Life and Psychosocial Issues in Scoliosis". The goal of this research was to determine the impact of scoliosis on health-related quality of life (HRQL), psychological functioning, and body image to improve patient outcomes. The research was carried out on adolescents and adults inflicted with scoliosis and showed that psychological health studies and body image affect treatment of scoliosis in adolescents; it also showed that adults with scoliosis may experience psychosocial limitations due to poor physical health or body image disturbance. (10)

David Mohr *et al.* (2005) carried out a research examining Beck's Depression inventory for people with multiple sclerosis. Subjects were college students with depressive disorder. The results of the research showed that people with higher level of depression are more likely to experience physical disorders like sclerosis (11).

In 2007, IK Penner *et al.* carried out a research on fatigue in multiple sclerosis and its relation to depression, physical impairment, personality, and action control. They assessed physical impairment by the EDSS and all other dimensions. The research was carried out on 41 MS patients using questionnaires. The results showed that physical impairment is an especial motivation for fatigue (depression, personality, etc.) (12).

In 1992, Norris, Douglas and Cochran carried out a research on people with anxiety, depression and hostility. Analysis of 147 adolescents between the ages of 13 to 17 revealed that these irregularities had significant relationship with physical impairment (13). Sapountzi-Krepia *et al.* (2001) carried out a research on perception of body image, happiness and satisfaction in adolescents who used Boston brace for treating scoliosis. The results of this research revealed that the group with scoliosis had a poorer perception of body image in comparison to the control group (14).

In 2003, Dagmar Reichel studied the psychological aspects of scoliosis patients. The results showed that diagnosis and treatment of idiopathic scoliosis can have major psychological consequences for patients affected with this disease (15). Payne *et al.* (1997) studied the psychological impact of scoliosis and whether gender plays a role. The samples of this research included adolescents between 12-18 years of age and with scoliosis. The results showed that scoliosis is a significant risk factor for the emergence of social, psychological and health-related difficulties (16).

Research Method:

The present research is descriptive and inferential statistics has been used as well. The data are collected using two questionnaires, namely Beck Depression Inventory and self-rating questionnaire (state-trait anxiety). Moreover, spinal mouse system has been used to determine the degree of scoliosis. We have also applied correlation coefficient and significance/insignificance in order to find the relationship between variables. The researcher has made no changes on the variables and has just measured them (5).

Active male students of universities of Tehran constitute the statistical population of this research. The population also includes individuals with scoliosis. In order to choose the samples, three universities (University of Tehran, Allameh Tabatabaee University and Physical Education Faculty of Islamic Azad University Central Tehran Branch) were selected using cluster sampling and from these three universities, 300 persons were randomly chosen of whom, 94 subjects with scoliosis were selected.

Materials:

Beck Depression Inventory:

Beck depression test is recognized as a “cultural analysis” test. In other words, it can be applied to different classes of society. Its validity has been assessed directly and indirectly and the test-retest correlation range has been calculated 0.48 to 0.9 in an interval of a few hours to a few months. Examining the reliability of Beck depression test showed that the average results of the Beck depression inventory increases with general rating of a psychologist and grading of a clinical specialist led to a significant correlation (0.56 and 0.67 in two separate analyses) (17).

Speilberger State-Trait Anxiety Inventory:

This test can be applied to an individual or a group of individuals and has no time limit. The validity of the test has been assessed based on its internal consistency, that is, measure of interference of all questions and Cronbach’s alpha formula.

Spinal Mouse:

This machine has been made in Switzerland by Dr. Carlucci with the support of IDP association. It has high validity ($r=94$) and is designed to measure angles and curvatures of different body parts, especially spinal column. First, subjects voluntarily filled out the questionnaires related to anxiety and depression; then, they prepared for the test of measuring the degree of scoliosis using spinal mouse in frontal standing.

Results:

After collecting the questionnaires and finding subjects’ degree of scoliosis, 94 subjects that were affected with this disease were chosen. Tables 1, 2, and 3 show the results of data analysis and assessment of research hypotheses.

Table 1: The relationship between scoliosis and depression in athlete and non-athlete students.

Statistical Index Group	Number of Students	Correlation (r)	Significance (P)
Depression of Athlete Students with Scoliosis	47	-0.153	0.495
Depression of Non-Athlete Students with Scoliosis	47	0.306	0.100

Considering the calculated P (0.495, 0.100), there was no significant relationship between scoliosis and depression in athlete and non-athlete students. The negative sign of the correlation (-0.153) signifies aninverse relationship between the two variables.

Table 2: The relationship between scoliosis and anxiety in athlete and non-athlete students.

Statistical Index Group	Number of Students	Correlation (r)	Significance (P)
Anxiety of Athlete Students with Scoliosis	47	-0.21	-0.925
Anxiety of Non-Athlete Students with Scoliosis	47	-0.111	-0.559

Considering the calculated P (-0.925, -0.559), there was no significant relationship between scoliosis and anxiety in athlete and non-athlete students. The negative sign of the correlations (-0.21, -0.111) signifies an inverse relationship between the two variables.

Table 3: The average of anxiety and depression of athlete and non-athlete students with scoliosis.

Statistical Index Group	Number of Students	Average	Standard Deviation	Value of P
Depression of Athlete Students with Scoliosis	47	12.22	6.91	0.810
Depression of Non-Athlete Students with Scoliosis	47	11.76	6.69	
Anxiety of Athlete Students with Scoliosis	47	39.27	8.18	0.436
Anxiety of Non-Athlete Students with Scoliosis	47	40.90	6.72	

Considering the calculated P (0.810), there is no significant relationship between average scoliosis and depression in athlete and non-athlete students.

Also, considering the calculated P (0.436), there is no significant relationship between average scoliosis and anxiety in athlete and non-athlete students.

Discussion:

Based on the results of the present research, there is no significant relationship between scoliosis and depression and anxiety in athlete and non-athlete students. This finding is consistent with researches of Andrew, Tons Megan, David Mohr, IK Penner, Sapountzi-Krepia et al., Stuart Weinstein, and Noonan et al., but is inconsistent with the findings of Dagmar Reichel and Julianne Schanz, which was based on studies done by Psychiatric Department of Bartlow Hospital, as well as studies of Baumgartner, Sucher, Moosburgger, Engel, William *et al.* and Sanchez.

College students form the samples of this research and since they study in reputable universities of the country, they feel less depressed and anxious in comparison to the rest of the people. Moreover, athlete students participate in sports competitions and therefore have a better mental status. The degree and angle of scoliosis of the samples of this research was less than samples studied in other researches. It is obvious that severity of deformity has a negative effect on psychological aspects. Since diagnosis and treatment of scoliosis can have major psychological consequences for the patient, scoliosis is considered a risk factor for the quality of life of individuals. When a person fails in face of difficulties of life, they feel baffled and panicky and fear that they might not be able to overcome their agitated thoughts and feelings. They may even think that panic, anxiety, depression and other inconvenient feelings are symptoms of lack of mental and physical balance that may eventually wear them out. As sports affect level of anxiety, gender of athletes can affect anxiety components. Crocrogahm, in his research on 35 males and females, discovered the fact that females are emotionally and socially weaker than males, have less self-confidence, and negative thoughts and cognitive anxiety is more frequently observed in them (18). Hayek et al. studied the nervous system disorder of individuals with postural deformity and concluded that people with postural deformity have less spirit, joy, and life expectancy and that disorder of nervous system affects all body organs (19). Anxiety and excitement followed by stress are internal phenomena, but they can clearly manifest themselves through contraction of muscles, increasing person's tension level, whose effect may be negative or positive (8). In the research carried out by Psychiatric Department of Bartlow Hospital, medical files of 601 patients residing at psychiatric hospital during 1845 to 1890 were analyzed; it was revealed that most of these patients had symptoms of schizophrenia and bipolar disorder and were also affected with postural deformities. These patients had no physical activity and suffered physically and mentally. The most prevalent disease of these people is overall pain which increase with age and with an increase of curvature and its shape. The cause and source of pain of the diseased people is not clearly known. Pain is very common in adults with scoliosis more than 45 degrees. This pain might be due to muscular fatigue or muscle strain. What is for certain is that in scoliosis, the normal position of spinal column is disoriented and mechanical pressures induced differ in various parts of spinal column. In some areas, great pressure is imposed and can itself be the source of other diseases of spinal column. The machine used for measuring scoliosis was more precise and had higher validity than those used by other researchers. Generally, we can say that many factors can affect the results of researches such as gender, sample size, statistical population, measurement tools for questionnaires, heredity, parents' behavior toward children, person's body image, living conditions, education, etc. Besides, we cannot claim that psychological factors that are considered as a variable only exist during treatment; rather they will forever be with the patient. There must be more researches in relation to different statistical populations in order for us to be able to eliminate this ambiguity. Therefore, it is recommended to have systematic planning (supplying sports materials and facilities) in order to prevent and treat postural deformities and psychological factors. We should encourage non-athlete students to have physical activities and to participate in public sports and we must use psychologists to treat individuals with severe anxiety and depression.

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