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THE RELATIONSHIP BETWEEN THE UPPER BODY DISORDERS WITH THE PHYSICAL FITNESS TESTS OF THE HIGH SCHOOL 15-17 YEARS OF AGE GIRL STUDENTS FROM SEMNAN

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ABSTRACT

The objective of the current study is the survey of the relationship between upper body physical disorders with the physical fitness tests of the high school 15-17 years of age girl students from Semnan. This study is a descriptive-analytic one. The study sample includes 500 high school 15-17 years of age girl students from Semnan. 100 individuals of the study sample were participated from each of the following schools: Brilliant Talents, Shahed, non-state, vocational and state schools each of which had been diagnosed with a disorder. At first, we dealt with some of the common disorders of the upper body organs by making use of the checkered sheet and the vertical line test and then the participants were tested for the physical fitness. The study findings are indicative of the emergence of various disorders of the upper body organs in a great many of the students. There are various factors influencing the emergence of the various disorders of the upper body organs in high school students especially the females. There is a significant relationship between the physical fitness record of fixed bar stretch and the 540-meter running or the forward-head posture ($p < 0.05$). There is a significant relationship between physical fitness records of sit-up crunch and 540 meter running and the round back (Kyphosis) disorder ($p < 0.05$). There is a significant relationship between the abdominal muscles and lordosis.

Keywords: *Upper Body Organs Abnormalities, Checkered Sheet, Vertical Line of the Physical Fitness Tests, Girl Students*

INTRODUCTION

Today, even with the increasing advances in the technology and modernization of the human's life its undesirable consequences which are totally a result of low physical activity and sometimes lack of movement have brought about problems such as different kinds of pains, diseases and bodily and spiritual abnormalities and physical fitness imbalance and so on. Simultaneously, with the growth of the industrialization phenomenon in the today's world and the decrease in the individuals' physical activity levels, performing inappropriate and nonsymmetrical activities and unfamiliarity of some of the individuals with the correct method of performing these activities the rate of the postural abnormalities prevalence has found a considerable advance among the society individuals. The bones are the supportive framework of the body and they are considered as the supporters of the muscles which enable our body movements and it is clear that their weakness and strength is effective on the formation and the movement of the organs. The only way for the reinforcement of the bone system is to have sufficient movement and they should be reinforced via exercises and sporting activities and keeping them in proper status.

The body of a multiple part living creature such as human beings cannot always maintain a single status and it constantly takes different postures and the human's body can rarely keep a constant and fixed position for a long time.

The body posture can be influenced by some of the physical and psychological factors. Therefore, the positional abnormalities such as torticollis, forward-head position, kyphosis, lordosis and flat back can become apparent in the in the spine. The muscular strength is the main element for exhibiting the amount of physical fitness and the human's body functional structure. So, the decrease in the muscular group's strength can cause the abnormal movement or dislocation in various parts of the body. Meanwhile, the role played by the upper extremities muscles in the protection of the spine in confrontation with the harmful stresses and strains has been frequently evaluated in the researches.

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Problem Proposition

The muscles around the spine are the postural muscles which contribute to keeping the body straight while standing and the body control while bending and standing up. There is this theory that the reduction of the upper extremities strength makes the body to muscularly tire and it increases the stress on the soft tissues and inactive structures of the dorsal spine. The dysfunction of the stabilizing muscles of the spine brings about the dorsal disorders for the other constituents of the spine including the intervertebral discs and it exerts an undesirable effect on the individual's social and physiological function. One of the spinal curvatures at the back region is called lordosis which exhibits a forward convex and a backward concave. This curvature or arc provides the required strength against the pushing forces influenced by the gravity, while at the same time enables a certain amount of movement and flexibility for the body. Basically, the back bone vertebral arc is influenced by the pelvis. The pelvis position is determined by four muscular groups. The waist extensor muscles, pulls the pelvis from the back upward and pulls its hamstring muscles downward. The abdominal muscles pull the pelvis from the frontal part upward and the flexor muscles pull the pelvis from the frontal region downward.

Study Background

Ferdjallah (2002) has stated in the studies of the lordosis that: there are numerous factors which play role in the appearance of the lordosis. The incorrect alignment of the pelvis with the spine which results in the shortening of the thigh flexor muscles and in contrast the lengthening of the abdominal region and back of the thigh muscles brings about a continuous tension in the shortened muscles and subsequently extreme and ongoing strain of the opposite muscles and this condition causes an abnormality and movement deficiency in the individuals diagnosed with such conditions. Similar to such results the studies performed by Hino (1990), Mord (1996), Levin (1997), Beckham Wyodas (2000) and Kim (2005) there is a significant relationship between lordosis and the abdomen strength. From the other hand, the two very important factors causing the abnormalities are the muscles strength and the amount of these muscles strain strength. The studies performed by Ahmadipoor, Goodman showed that exercise is effective on the increase in the muscles strength and increasing the strength of the back muscles has also improved the kyphosis symptom.

Arshadi (1385) has dealt with the evaluation of the relationship between the back extensor muscles strength and the flexibility of the spine with the kyphosis and lordosis amount and found a significant relationship between the back extensor muscles and lordosis and indicated that the back extensor muscles strength is the best predictor of the kyphosis. There are various factors for the emergence of the forward-head position symptoms; some of the researchers have observed that the forward-head position takes place in doing activities such as driving, studying, watching T.V., performing some jobs on the desk or computer keyboard in which the shoulders are not aligned on a vertical line and one of the shoulders is in a lower level in relation to the other. Dropped shoulder is one of the most common problems of such abnormalities which is observed in many of the overhead movements, sport activities or the everyday life and in many of the occupations as well.

Kim (2006) and Christopher (2004) in numerous studies have reported the reduction in the upper extremities muscles in sportsmen and women with lordosis. This imbalance in the bust muscles strength makes the stress on the spine in the dorsal region to take place.

MATERIALS AND METHODS

Study Methodology

The methodology of the current study is a field study and the study is proposed based on the inference-analysis style. The study sample is the high school girl students from the first and second grade of Semnan county during the curriculum from 2010-2011.

The volume of the sample ranged in age from 15-17 in respect to the approximate population of about 3000 people of the high school students under study who were studying in one of the Brilliant Minds, Shahed, Non-state, vocational, state high schools in the second semester of the curriculum year from 2010 to 2011. 100 people were selected randomly from each of the five above mentioned high schools and the

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total number of the sample reached to 500 people all of whom had been recognized with an abnormality and they underwent the test. The inference statistical method based on Spearman method was taken advantage of to determine the relationship between the variables including the Chi-Square test (Chi score) to perform the hypotheses tests and to compare the items intended by the study. All of the calculations and computations have been done by making use of the SPSS-15 and the significance level for all of the computations is ($p < 0.05$).

The tools and the means used in the present study are:

- The checkered sheet and vertical line have been used for the evaluation of the spine disorders from the frontal, dorsal, lateral view.
- The sit-up pad for the evaluation of the strength and the endurance of the abdominal muscles.
- Flexibility box for the measurement of muscular flexibility of the muscles at the back of the thigh.
- The modulated Fixed Bar for the measurement of the strength and endurance of the muscles of the waist belt region.

RESULTS AND DISCUSSION

Findings

There is no relationship between the forward-head position disorders and some of the physical fitness factors of the high school students from different schools in Semnan.

Table 1: The Spearman Correlation Test Results for the Study of the Relationship Between Physical Fitness Factors and the Forward-Head Position

Factor	Correlation Value	Number	Significance Level
Flexibility	0.006	496	0.890
Fixed Bar	0.117	492	*0.010
High Jump	0.26	500	0.564
Sit up	0.016	496	0.728
540 Meter Running	-0.108	500	*0.015

Table 1 indicates the direct relationship between the forward-head position disorder exhibition and flexibility, fixed bar, high jump and sit-up for the students. From the other hand, there is an inverse relationship between the emergence of such disorder and the 540-meter running record. That is to say that the reduction in this record is accompanied with the reduction in forward-head position disorder. According to the significance levels in the table it is observed that only the relationship between the emergence of forward-head position disorder and 540-meter running is statistically significant and meaningful. Therefore, the relationship between the emergence of the forward-head position disorder and flexibility, fixed bar, high jump and sit-up of the students is rejected ($p < 0.05$). But, the relationship between the forward-head position disorder with the other factors cannot be denied.

There is no relationship between the asymmetric resting scapular Posture and some of the physical fitness factors of the high schools students in various schools of Semnan.

Table 2: Spearman Correlation Test Results for the Survey of the Relationship Between the Physical Fitness Factors and Asymmetric Resting Scapular Posture

Factor	Correlation Value	Number	Significance Level
Flexibility	0.0576	496	0.208
Fixed Bar	-0.065	492	0.153
High Jump	0.066	500	0.14
Sit Up	-0.007	496	0.875
540 Meter Running	-0.58	500	0.193

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Table 2 shows the direct relationship between the asymmetric resting scapular disorder and flexibility and high jump for the students. That means that the increase in the students' records is accompanied with the increase in the emergence of such a disorder. From the other hand, there is an inverse relationship between the emergence of this disorder and fixed bar, sit-up and 540-meter running records of the students. According to the significance levels of the table it is observed that there is no relationship between the emergence of the asymmetric resting scapular disorder and all of the physical fitness factors of the students ($p>0.05$).

- There is no relationship between lordosis and some of the physical fitness factors of the high school students in various schools in Semnan.

Table 3: The Spearman Correlation Test Results for the Study of the Relationship Between the Physical Fitness Factors and Lordosis

Factor	Correlation Value	Number	Significance Level
Flexibility	0.079	496	0.08
Fixed Bar	-0.086	492	0.057
High Jump	0.016	500	0.724
Sit Up	-0.131	496	*0.003
540 Meter Running	-0.163	500	*0.000

Table 3 is indicative of the direct relationship between the lordosis disorder and flexibility and high jump of the students. That means that the increase in students' records is accompanied with the increase in the emergence of the disorder. From the other hand, there is an inverse relationship between the emergence of such disorder and fixed bar, sit-up and 540-meter running records of the students. That means that the increase in this record is accompanied with the decrease in the lordosis disorder. According to the significance levels it is observed that there is a significant relationship between the emergence of lordosis and sit-up and 540-meter running records ($p<0.05$), but there is no significant relationship between the emergence of lordosis and flexibility and high jump and fixed bar records ($p<0.05$).

- There is no relationship between kyphosis and some of the physical fitness factors of high school students in various schools in Semnan.

Table 4: Spearman Correlation Test Results for the Survey of the Relationship Between Physical Fitness Factors and Kyphosis

Factor	Correlation Value	Number	Significance Level
Flexibility	0.016	496	0.721
Fixed Bar	0.040	492	0.375
High Jump	-0.025	500	0.576
Sit Up	-0.002	496	0.972
540 Meter Running	-0.05	500	0.267

Table 4 is indicative of the direct relationship between the kyphosis disorder and flexibility and fixed bar stretch of the students. That means that the increase in students' records is accompanied with the increase in the emergence of the disorder.

From the other hand, there is an inverse relationship between the emergence of such disorder and high jump, sit-up and 540-meter running records of the students. That means that the increase in this record is accompanied with the decrease in the kyphosis disorder. According to the significance levels it is observed that statistically there is no relationship between the emergence of kyphosis and all of the

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physical fitness factors ($p < 0.05$), but there is no significant relationship between the emergence of kyphosis and flexibility and high jump and fixed bar records ($p > 0.05$).

Discussion

There is a direct relationship between round back disorder and high jump records of the students. From the other hand, there is an inverse relationship between the emergence of such a disorder and fixed bar, sit-up and 540-meter running records of the students. That means that the increase in this record is accompanied with the decrease in the disorder. According to the significance levels it is observed that there is no significant relationship between flexibility, fixed bar stretch and high jump with round back disorder ($p > 0.05$). There is a significant relationship between round back disorder and sit-up and 540-meter running records ($p < 0.05$). The results obtained in the current study conform with the results obtained by some of the researchers. (Karbala'ee, 2008) recognizes muscular strength as a fundamental element for indicating the physical fitness and the capability of human body structural function. Therefore, the reduction in the muscular strength can result in the abnormal movement or dislocation of various parts of the body. Sokhangooy and his colleagues (2007), there is a significant relationship between the round back disorder and 540-meter running. Daneshmandi *et al.*, (2007), there is a significant relationship between round back disorder and vitality capacity. J. Mad (2008), round back depends on several factors: shortening of the muscles and their weakness and shoulder muscles strain, extreme tilting of the dorsal region of the shoulder which makes the chest muscles to become short Crown *et al.*, (1993), spine disorders result in the reduction of the vitality capacity. Sitachi (1996), a negative correlation is observed between these muscles strength and kyphosis. Also, in the high rates of the extensor muscles strength the kyphose probability becomes lower.

There is a direct relationship between lordosis and flexibility and fixed bar stretch of the students. From the other hand, there is an inverse relationship between the emergence of such a disorder and the high jump, sit-up and 540-meter running records of the students. According to the significance levels observed in the table it is seen that the relationship between the emergence of this disorder and all of the physical fitness factors is not statistically significant ($p > 0.05$). The results obtained from this study is conform with the results obtained by some of the researchers. Kashef (1996), there is no significant relationship between all of the physical disorders and physical fitness. There is a direct relationship between abdomen strength and lordosis. The results obtained from this study conforms with the results obtained by Qanbarzadeh (2002), Aqdani (2000), Kim (2006), Kandall (2005), Alizadeh (2004), Christopher (2004), Bekham Viewdas (2000), Levin (1997), Morde (1996), Yeno (1990) indicating that there is a significant relationship between the abdomen strength and lordosis. The results obtained from this study is not conformant with the results obtained by some of the researchers: Shoja-Al-Din *et al.*, (2007), Sadeghi and his colleagues (2007): there is no significant relationship between the upper extremities muscles with the lordosis angle.

(Alvandi, 1995) based on chi square root test (χ^2): There is no significant difference between the results obtained from Mathias test and the lordosis emergence. Performing activities or not performing activities as a single factor has not led to lordosis. Walker *et al.*, (1998) have also confirmed the Tommy's theory. Of course, the majority of the researchers who have rejected the physical activity effect on changing the lordosis rate have not studied the study population based on regular physical activity condition or the functional effect of one of the muscles on lordosis has not been surveyed by itself. While, the functional effect of the pelvis muscles on the lordosis rate is accompanied with each other and they should be studied in harmony. These notions are particularly opposite to the Kendall's and William's ideas who believe that sedentariness or inactiveness leads to lordosis. Many of the theorists like Davis (2004), Franklin (2005), Bening (2003) recommend that individuals with a high rate lordosis try strengthening their abdominal muscles which are lengthened their lengths in order to be able to give the pelvis an ability to turn back and by doing so to reduce the lordosis.

There is a direct relationship between the forward-head position and flexibility, fixed bar, high jump and sit-up. From the other hand there is an inverse relationship between the emergence of such a disorder and 540-meter running. Only the relationship between the forward-head position and 540-meter running is

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statistically significant ($p < 0.05$) which conforms to the studies performed by Kashef (1996), Barqi Moqaddam (1996).

There is a direct relationship between the asymmetric resting scapular disorder and flexibility and high jump. From the other hand, there is an inverse relationship between the emergence of such a disorder and fixed bar, sit-up and 540-meter running records. According to the significance levels it is observed in the current table that there is no significant relationship between asymmetric resting scapular disorder and all of the physical fitness factors of the students ($p > 0.05$). This study conforms with the studies performed by Qanjali (2008), J. Mad (2008), Kim (2006), Hong *et al.*, (2005, 2007) Sitachi *et al.*, (1996), Yeno (1994), Crown *et al.*, (1993).

Conclusions

Paying attention to one's health is one of the challenges every person faces every day. Therefore, it is necessary for the community members to become aware and informed of their health statuses because physical disorders cause outcomes such as muscular fatigue, joints' deformation, individuals' biomechanical imbalance, nerve pains and muscular pains and eventually social psychological problems due to physical unfitness of the individuals' bodies. Based on the present study findings it is necessary to pay a more serious attention to providing physical activity grounds and combating sedentariness or the lack of activity of the students particularly girl students, also students' screening programs should be taken into consideration. Besides, knowing that physical fitness is more effective on the students learning and education the students with positional disorders should be identified and they should be referred to the centers and practitioners for improving their movements.

Therefore, to reach that goal it is necessary that authorities and the programmers in charge of physical education and schools hygiene lessons try to correctly and exactly program such lessons in order to enrich the lesson hours of physical education. Offering intervening programs and prevention methods through physical education programs and teaching and making the teachers, parents and students familiar with the desirable and undesirable physical statuses via brochures, books and journals along with the creation of proper ergonomic educational environments and teaching the correct methods of standing, sleeping, walking and carrying things specially school bags and the correct use of tools will save us the heavy, long time treatment costs. Therefore, sport is not only significantly effective on the prevention and treatment of the physical disorders and the treatment of the bone muscular system but it is also cost-effective and it seems necessary to promote the physical activity culture in the society.

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