*Indian Journal of Fundamental and Applied Life Sciences ISSN: 2231– 6345 (Online)*
*An Open Access, Online International Journal Available at www.cibtech.org/sp.ed/jls/2015/04/jls.htm*
*2015 Vol. 5 (S4), pp. 1198-1202/Payam*
***Research Article***

# THE IMPACT OF CORRECTIVE EXERCISES ON MUSCULOSKELETAL DISORDERS OF MALE STUDENTS IN KHUZESTAN

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## ABSTRACT

Recognition of deformities and corrective exercises is considered a branch of physical education that seeks to remove muscle and organic weakness and various anomalies, coordinate and balance of movements by using exact and basic exercise programs. The aim of this study was to investigate the effect of regular corrective exercises on skeletal disorders (scoliosis, genu varum, shoulder drooping and flatfoot) of male students in Khuzestan in the academic year 2014-2015. The present study is Quasi-experimental. 160 male students of Khuzestan were chosen as statistical sample. Tools include plaid page, knitted scope, tests associated with measuring abnormalities, plummet and kilometer strip. The questionnaire was used as the pre-test and post-test to check the strengthand stretching exercises for 24 sessions during 2 months and analysis of data was performed by using COVAT. The abnormality of drooping shoulders, flatfeet and genu varum among 12 years old boys were significantly decreased after exercise but no significant difference has been observedin the case of scoliosis. The drooping shoulder, flatfeet and genu varum among 13 years old boys after training were significantly decreased but no significant difference was seen concerning scoliosis. The abnormality of shoulder drooping, flatfeet and genu varum among 14 years old boys after exercises has been decreased, but no significant difference was observed in the case of scoliosis.

***Keywords****: Corrective Exercises, Genu Varum, Flatfeet, Scoliosis, Shoulder Drooping*

## INTRODUCTION

The quality of human physical condition is of particular importance in human life, because changes and transformations affect the other human conditions. Consequences of incorrect posture are so high that physical, mental, economic and social aspects can be investigated (1) requirement to achieve optimal physical condition is to use correct tools and methods to achieve this important goal.

Physical condition is a result of coordination and cooperation of the various members of the body, particularly muscles and bones. Bones support the body and the muscles are movers of the supportive framework of body and it is clear that their weaknesses and strengths affect on the formation and movement of organs. The only way to strengthen this system is to have sufficient mobility and strengthening through exercises and sports activities and maintain good condition of the organs. Recognizing the deformities and reformative movements is considered a branch of physical education which is going to remove the different muscle and organic abnormalities and weaknesses, coordination and balance by using precise and basic movements and sports programs. The general causes of skeletal abnormalities, genetic and congenital disorders, diseases and harm are the lack of physical activity, inappropriate habits of sitting and standing, carrying heavy objects, body type, appearance and age. Drooping shoulder to the right or left is a condition in which shouldersaren't in line with a horizontal line and one shoulder is lower than the other one. Scoliosis is a sideways curvature of the spine that in which the frills spinal cord shift to the convexity. Genu Varum is a condition in which the medial condyles of thigh go away from each other and creates appearance like braces or bow in the knee. Flatfoot is a condition in which the inner arch of the foot disappears or is reduced. Corrective exercises are introduced as a "known effort" that remove physically abusive situations such as thoracic kyphosis, scoliosis and

lumbar lordosis through coordination of agreed and opposed muscle groups and by strength and stretching exercises.

Mahdavinejad study entitled as the impact of physical activity and sports on abnormalities of the spine showed that significant correlation exists between the use of exercises and improving deformity. In the study of Mazlomi, abnormalities of the spine were diagnosed as the most abnormalities among the girls and they were reduced by exercise until 50%. Carter's study, the impact of corrective exercises on women's disorders showed significant results.

Since corrective exercises include stretching or flexible and strength exercises and doing these exercises requires physical activity, exercise and physical activities have been told to in many texts to improve and reform anomalies. Unfortunately, abnormalities are created in Students. Since students are growing and maturing, and the formation and development of musculoskeletal conditions occur at this time and musculoskeletal disorders gradually change into more severe side effects and makes their body weak and in appropriate. Because the physical abnormalities have consequences such as muscle fatigue, joint deformation, a biomechanical imbalance, nerve pain and muscle and ultimately cause psychosocial problems for the peopledue to lack of fitness. According to studies in the field of musculoskeletal disorders and because of the prevalence of abnormalities in Khuzestan was considerable and existence of obstacles among the population of boys hindering identification and stop follow-up treatment in the puberty that cause some effects on adulthood. Since no study has been registered in this regard with the aim of treatment, the present study has been conducted to show that correcting exercises have effect on the anomalies of the upper and lower organs (shoulders drooping, scoliosis, genu varum and flatfeet) among the male students of Khuzestan in academic year 2014-2015.

## MATERIALS AND METHODS

The present study is quasi-experimental. The study population includes all guidance school students of Khuzestan in academic year 2014-2015. 10 male secondary schools in various parts of the city were chosen by using cluster sampling method and after examining students, 160 subjects were identified having musculoskeletal disorders. The data was collected in addition to the personal information by using survey instrument consisting of checkerboard, knitted scope, caliper, meter, scale, questionnaire to identify the four disorders (drooping shoulder, scoliosis, genu varum and flatfeet). 12-14 years old students who had no history of bone and joint disease, spinal fractures but one of the considered disorders were assessed in terms of abnormalities. After getting consent to participate in research, the student put on the suitable cover for easy measurement of the anomalies and he should stand against the checker board or plumb line to examine students' spin from the backside. Plumb line should come down from the tubercle of the occipital bone and pass on the spine in order to pass through the buttocks. As a result, such deviations to the right or left shoulder and spine curvature can be observed by using this method. In view of the spine from the lateral side, vertical line should be above and the earlobe, middle of the shoulder (last apophysis), the outside and lateral part of the pelvis, the outside and lateral part of the kneecap and outside front part of ankle. Adams's test was used to diagnose structural and functional scoliosis and the students were asked firstly stand in vertical stance and then bend their heads ahead and touch their knees with their hands and by standing behind the students, borders of scapula and spin were examined. To diagnose genu varum, the students were asked to stand in a manner of lying back so that their medial ankles could touch each other and then the interval between the two inner thigh condyles was measured by using a caliper and this distance is natural at about one centimeter and more than this is unnatural and it is said as genu varum. Corrective exercises to fix this disorder include strengthening exercises for muscles of outside crus and thigh, such as the Quadriceps muscle, fibula muscle groups, stretching exercise for the medial muscles of the legs such as semi-membranous muscles, semi-chord, right internal and tibialis anterior muscle, and also stretching exercise for the capsule inside the knee. In the present study a set of mirrors were used to detect condition of flat foot or (manual Scoop) in the way that student went barefoot on the glass surface and then effect of his foot in a diagonal mirror under glass were studied. All measurement and examination tools including chessboard, manual Scoop, caliper, meter,

scale has been used in the studies already done in the field. So, it appears that the most reliable instruments have been used for detecting deviations in this study. Exercises were done during 2 months or 24 sessions (three sessions per week, each session duration was at least an hour) in Takhti sports hall of Khuzestan. Measurement and examination method of organic status of students complied with the medical standards and thus data of this examination was recorded on the pages made for this purpose. Exercises applied in this study consisted of stretching short muscles, such as the lumbar spine extension muscles, the upper flexion muscles, lateral external muscles of crus and thigh, the external capsule of the knee, external ligaments of knee and ankle and armpit muscles as well as PNE exercises through receivers effective stimulation were applied to strengthen weak muscles such as the rectus abdominal, Hamstring, lateral muscles of the spine for better and faster performance. After gathering the information, the data was analyzed by SPSS version 15 and the use of inferential, analysis of covariance statistical tests.

## RESULTS AND DISCUSSION

### *Findings*

The findings show that among 160 students selected from the statistical population, the average age of the subjects is 13.8 ± 9.1. Good family income level (25%), moderate (45%) and poor (30%). The first birth rank (47%), second (35%) and the third… (18%) respectively. After two months of exercise of the male students in the guidance school showed that the abnormal drooping shoulders, flatfeet and genu varum has been significantly reduced in the boys 12-year-old after practice (respectively F = 27.63, P <0 . 001, F = 100.1, P <0.001, F = 96.7, P <0.001). But there wasn't significant difference in the case of scoliosis (F = 3.32, P <0.001). Abnormality of drooping shoulders, flatfoot and genu varum about 13 years old boys was significantly after exercise (respectively F = 27.63, P <0.001. Abnormality of drooping shoulders, flatfoot and genu varum about 13 years old boys was significantly after exercise, (respectively F = 27.63, P <0.001, F100 . 1, P <0.001, F = 7/96, P <0.001). But there wasn't significant difference in the case of scoliosis (F = 3.32, P <0.001).

| **Abnormality** | **Number** | **12 Years Old** | | **13 Years Old** | | **14 Years Old** | |
|---|---|---|---|---|---|---|---|
| | | **Pretest** | **Posttest** | **Pretest** | **Posttest** | | |
| drooping shoulder | (55) | 48.2 ± 1.8 | 48/2 ± 1/8 | 46 ± 1.7 | 44/2 ± 1/3 | 47/2 ± 1/9 | 45/2 ± 1/2 |
| scoliosis | (45) | 9.1 ± 1.3 | 8.9 ± 5/7 | 8.7 ± 2.6 | 8.1 ± 5.7 | 12.1 ± 1.8 | 12.9 ± 2.3 |
| flatfeet | (30) | 37.5 ± 0.8 | 35.1 ± 0.7 | 38.2 ± 0.8 | 35.7 ± 0.9 | 38.8 ± 1.1 | 36.4 ± 1.1 |
| genu varum | (30) | 35.2 ± 1.2 | 33.2 ± 1.2 | 34.2 ± 0.8 | 34.2 ± 0.8 | 48.2 ± 1.8 | 34.1 ± 0.8 |

### Discussion and Conclusion

The aim of this study is to investigate the effect of exercise and reforms on musculoskeletal disorders among the boys of the guidance school. The results showed that the degree of abnormalities in the samples concerning drooping shoulders, flatfeet and genu varim was decreased and the difference between the pre-test and post-test was statistically significant. These findings were consistent with the findings of Barrett & Meyer. Meyer stated that strength exercises do not affect the tendons of muscles and move different skeletal parts and make the ligaments stable and resilient. Stretching exercises act as coordinator of opposed and agreed muscles. Therefore, such exercises increases muscle length in the concavity and make the power of muscles increase in convexity and abnormality will ultimately be reduced. In this study, 31.5% of patients had curvature of the spine to the right or left and in Khosh bakhti's study 9.7 percent of the boys had Spinal disorders. Exercise and reforms didn't create any change in the tilt of the spine to the left and right so that more than half of the samples remained in the original condition. As it is clear the curvature of the spine (scoliosis) generally is more hidden than other abnormalities except in exceptional cases for surgery. Therefore, appropriate answer wasn't achieved

concerning exercise. Another reason is that the exercises may not be done correctly for the study group and these findings were not consistent with the results of Morningstar and exercise is recommended at about more time.

Exercises for 2 months and correction were quite effective on drooping shoulders. Khajouei study in Bushehr showed that scoliosis abnormality which was 43%, it was decreased to 28 percent after corrective exercises, the degree of abnormality of drooping shoulder decreased from 24.16 to 13.07 and 12.75 to 8.9 in the left shoulder. Exercises for 2 months and correction were quite effective on genu varum so that 64 percent of samples' condition got better and helped their disorder be eradicated. Slight genu varum problem is common in the first 2-3 years of life and often this is because of children's growth and movement and it is generally fixed before school. This condition has been reported as the most common lower organ disorder among secondary school students in Tehran with the value 40.71%.

In this report, the highest rate of genu varum and the distance between knees has been registered in the range of 2-4 cm. Other similar studies in age groups and other geographical areas confirmed prevalence of the mentioned disorder. Corrective exercises have had an impact on the condition of flatfeet and have made the disorder better in the research samples so that about 61% of the subjects in the study improved their situation. As we said researcher's exercises have lasted for 2 months and 24 sessions, so exercises can be continued more time for even a few years to completely eliminate the defects in the body. In addition, what has been considered for the researcher in terms of disorders was the smallest change even the size of a centimeter or a millimeter improvement and it should not be expected for example the problem of flatfoot of Grade 3 completely to be fixed. Rather improving the flatfoot from grade 3 to grade 2 should be considered positive change. The aim of the present study was whether therapeutic and corrective exercises affect on the organ problem and abnormalities or not? According to the results, it can be proved that approximately therapeutic and corrective exercises effect on the skeletal malformations provided that it can be conducted properly by the trainer and the trainee. Mahdavinejad's study, the impact of exercise and motor activities on deformity of the spine, showed a significant association between the use of exercises and improving abnormalities. In the study of Mazlomi, abnormalities of the spine were diagnosed as the most abnormalities among the girls and 50 percent of them improved by exercise. In Carter's study, significant results were obtained from the impact of corrective exercises on women's disorders. Caring each person's health is the most important concerns for everyone. Thus one's informing about his physical condition is necessary. Because the physical abnormalities have consequences such as muscle fatigue, deformed joints, disturbing the biomechanical balance of the individual, neuromuscular pain ultimately psychosocial problems due to lack of fitness. According to the findings of the present study it can be concluded that applied corrective exercises in this study can be inexpensive and without side effects solution to resolve musculoskeletal disorders. It is recommended this study to be conducted in primary school and kindergartens and identity of corrective actions to be provided for individuals.

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