

The Relationship Between Physical Fitness and Standing Postural Deficits in Middle School Adolescence Ages 12-14

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Abstract

Posture is the foundation for fitness. The most common cause of injury in adults is musculoskeletal. Prevention of such injuries starts with correct posture. Due to the limited information available on the relationship between physical activity and posture, this research attempted to determine if a significant correlation existed between the two in middle school adolescence ages 12-14. The subjects were chosen by a sample of convenience. All subjects were volunteers from the Maize Middle School physical education classes. The subjects' physical fitness was tested using a group of assessments from the Fitnessgram. Each subject was assessed using the PACER, curl-up, push-up, and sit-and-reach tests in comparison to the appropriate age standard to determine a healthy fitness zone. Then each subject was assessed for posture using a Plexiglas grid. The subject were positioned behind the grid, using the anterior lateral malleolus as the anatomical landmark for proper positioning to assess the posture at the levels of the ear lobe, the acromion, the posterior greater trochanter, and slightly anterior to the axis of the knee joint. The results were analyzed using the Pearson correlation to determine if there was a relationship between the anatomical posture landmarks and the individual physical fitness tests in the chosen population with females and males separated. It was concluded that there is no correlation between physical fitness and posture in females or males ages 12-14.

Introduction

Posture is the foundation for fitness. "Fitness requires movement. Movement is generated by muscles working together within our body skeleton. Proper posture means our skeleton is aligned in a manner that provides for movement efficiency and grace with minimal risk of injury; the way we were designed to move, sit, and stand." [1] Although there have been few studies done on the topic of the influence of physical fitness and its affect on posture, Miller found that the most common cause of injury in adults are musculoskeletal. Prevention of such injuries starts with correct posture. As the U.S. has become more sedentary, posture has become more dysfunctional. Previously, good posture was natural, especially for

children, but now, deep couches, television, video games, computers, and poor school chairs have promoted incorrect posture. The population will greatly benefit from the promotion of physical fitness and its postural foundation by lowering musculoskeletal injury. [1]

Experiment, Results, Discussion, and Significance

The research compared the adolescent's lateral standing posture to his/her level of physical fitness. Ideal lateral standing posture is defined as "a straight line that passes through the ear lobe, though the bodies of the cervical vertebrae, the tip of the shoulder, midway through the thorax, through the bodies of the lumbar vertebrae, slightly posterior to the hip joint, slightly anterior to the axis of the knee joint, and just anterior to the lateral malleolus." [2] The posture was assessed using a straight plumb line and scored by measuring any deviations from the norm, as stated above. The FITNESSGRAM was used to assess the level of physical fitness in each individual. The FITNESSGRAM is a group of physical fitness assessments which include the PACER, curl-up, push-up, sit-and-reach, and trunk lift. The FITNESSGRAM focuses on cardiovascular endurance, muscular strength and endurance, and flexibility. The null hypothesis is that there is no relationship between the physical activity level and normal lateral standing posture among middle school adolescence ages 12-14.

This study had a total of 17 male participants and 18 female participants, ages 12 to 14, with the majority of the subjects at the age of 13. The FITNESSGRAM standards determined if a subject was in the healthy fitness zone according to his/her age. Out of the 35 total subjects, 32 were classified as in the healthy zone for the PACER, 31 for the curl-up test, 11 for the 90° push-up test, and 23 for the back-saver sit and reach test. The results of the FITNESSGRAM test were correlated to the lateral anatomical postural landmarks to determine if there was a relationship between lateral standing posture and physical fitness. The correlation

found that there was a relationship between the sit and reach test and the acromion and between push-ups and the trochanter in the male subjects.

Conclusion

Our research found that there is no relationship between physical activity level and normal standing posture among middle school adolescence ages 12-14.

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- [1] Miller von Foerster M. Our Kids, Backpacks, and the Back Epidemic. *Orthopaedic Practice*. 2003;15(3):34-39.
- [2] Magee DJ. *Orthopedic Physical Assessment*. 4th ed. St. Louis: Saunders Elsevier; 2006.

