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ORIGINAL RESEARCH
TEST-RETEST RELIABILITY OF TETRAX® STATIC POSTUROGRAPHY SYSTEM IN YOUNG ADULTS WITH LOW PHYSICAL ACTIVITY LEVEL

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ABSTRACT

Purpose/Background: Assessment of postural sway with force plates can be affected by type of measurement and various clinical parameters such as age and activity level of the individual person. For this reason, variability is detected in postural reactions of healthy subjects without balance impairment. Test-retest reliability of postural sway in adolescent athletes has been measured using a force plate and additional test-retest studies have been suggested for subjects of different age groups with different activity levels. Therefore, the purpose of this research was to assess test-retest reliability of Tetrax® Static Posturography in young adults with low physical activity level, and examine the relationship between posturography results and low activity level.

Methods: Young adults older than 18 years of age were included in the study. Demographic characteristics of the cases were recorded including age, weight, height, body mass index (BMI, kg/m^2) and dominant extremity. Number of falls in the previous six months, lower body endurance (sit to stand test) and single-leg eyes closed stance test were recorded. Activity level of participants was determined according to the International Physical Activity Questionnaire (IPAQ). Posturographic evaluation of all volunteers was completed using the Tetrax® Interactive Postural Balance System (Sunlight Medical Ltd, Israel). Fall risk and general stability index (SI) calculated by the Tetrax® were recorded. Following the first test, measurements were repeated 24 to 48 hours later for reliability purposes.

Results: Sixty-five subjects (28 male, 37 female; mean age 22.2 $\pm$ 1.1 years, mean BMI 22.6 $\pm$ 3.3 kg/m^2) were evaluated. All participants were classified as minimally active according to mean IPAQ score (1042.1 $\pm$ 517.7 [231 – 2826] MET- minutes per week). ICC scores between the first and second tests for fall index and total stability index were excellent (ICC$_{2,1}$ = 0.858, 0.850, respectively). Fall risk determined by using the Tetrax® device was negatively correlated with lower body endurance (p = 0.001, r = -0.446), vigorous activity score (p = 0.011, -0.312) and total activity score (p = 0.029, r = -0.271), and positively correlated with single leg stance score (p = 0.001, r = 0.606). There was a weak correlation between fall risk history and the fall risk determined by using Tetrax® device (p = 0.04, r = 0.255). There were no correlations between fall risk and height, weight, and BMI (p > 0.05).

Conclusions: The results demonstrated the high test-retest reliability of Tetrax® interactive balance system in young healthy adults with low physical activity level. Future studies are needed to determine the effectiveness of increasing physical activity level on postural control.

Keywords: Balance, physical activity level, static posturography

Level of Evidence: III

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