GNYACSM Abstract

Relationship Between Y-Balance Scores and Lower Extremity Mobility and Strength Measures in Division I Student-Athletes

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ABSTRACT

The Lower Quadrant Y-Balance (LQYB) test is a common measure used to evaluate dynamic balance, symmetry, and injury risk. However, more research is needed to understand the relationship between LQYB scores and other risk factors for injuries, such as impaired ankle dorsiflexion (ADF) range of motion (ROM) and hip strength. **PURPOSE**: This study examined the correlation between composite scores for the LQYB composite scores and ADF ROM, hamstring ROM, hip abduction (ABD) and adduction (ADD) strength, and both hip internal (IR) and external rotation (ER) ROM. M**ETHODS**: Data was analyzed from 169 male Division I student-athletes (19.9 $\pm$ 1.5 y, 181.8 $\pm$ 7.9 cm, 181.0 $\pm$ 25.0 lbs) who participated in pre-season screening following physician clearance. ROM for the ankle and hip were measured with an iPhone clinometer application. ADF ROM was assessed with the athlete starting in a half kneeling position, then actively moving the knee forward over the foot towards a wall. ADF ROM was recorded at end ROM. Hip ABD and ADD were assessed with the athlete in a side-lying position using a dynamometer, and passive ROM for hip IR and ER were measured with the athlete in a prone position. A sit-and-reach test using a standard box was used to measure hamstring ROM. For the LQYB, each athlete began with a single leg stance on the right lower extremity (LE), then attempted to stretch the left LE as far as possible in the anterior, posterolateral, and posteromedial directions. Leg length for bilateral LEs was used to calculate composite scores. Descriptive statistics and correlations were calculated using SPSS version 29 (IBM Corp) with an alpha significance level of $p < 0.05$. **RESULTS**: Significant correlations were found between right LQYB and right hip ADD ($r = 0.21$), left hip ABD ($r = 0.20$), and both right and left ADF ROM ($r = 0.30$ and 0.40). Left LQYB was significantly correlated with left LE ADD ($r = 0.17$) and ABD ($r = 0.18$), and both right and left ADF ROM ($r = 0.32$ and 0.34). **CONCLUSION**: LQYB composite scores had significant correlation to hip strength and ADF ROM, suggesting that athletes with better LQYB composite scores may exhibit better hip stability and ankle. Addressing ankle mobility and hip strength deficiencies may be of interest to exercise or rehabilitation professionals looking to decrease injury risk that may be due to less than optimal dynamic balance.