

Lower Extremity Functional Screen for Biomechanical Faults in Female Athletes

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Compliance of subject records protection was followed according to the IRB approval from St. Catherine University

No funding

Background and Purpose: Lower extremity injuries account for the greatest proportion of athletic participation injuries in females. Traditional medically based pre-participation screening lacks a performance assessment from which to determine athletic preparedness. The purpose of this study was to develop a reliable functional screen in order to identify biomechanical faults in a female athletic population.

Methods: Twenty-two female subjects (25.05 ± 3.88 years) were recruited from the St. Catherine University DPT class. Hand-held dynamometry was used to assess hip strength. The modified Star Excursion Test (mSTEB) was used to assess single-leg balance. The Lower Extremity Functional Screen was developed with the following tasks: double-leg squat (DLS), double-leg jump (DLJ), single-leg squat (SLS), single-leg hop (SLH), and a leap (LP). Each participant was videotaped performing the screen following a description and demonstration of each task. Recorded videotapes of all subjects were viewed and scored independently by five testers. The graded task was scored on a 0 to 3 scale. Component scores were added to obtain a total possible score of 21 points with a higher score hypothesizing better leg mechanics and a lower risk of injury.

Results: Inter-rater reliability for five raters was calculated using interclass correlation coefficient (ICC). Reliability for each task ranged from moderate to good (ICC=0.63-0.84): DLS=0.835; DLJ=0.691; right SLS=0.812; left SLS=0.802; right SLH=0.745; left SLH=0.627; LP=0.716. Reliability for the total score was also identified as good (ICC=0.88). Weak to moderate correlations were found between single-leg squat tasks and either hip ABD or hip ER strength ($p=0.016-0.088$).

Conclusion: These results indicate that the Lower Extremity Functional Screen developed for this study is a reliable tool. The data did not show a strong correlation between the functional screening tool, hip strength, and balance. This may suggest additional factors are involved beyond strength and balance during these functional tasks.