

ORIGINAL RESEARCH

PROSPECTIVE FUNCTIONAL PERFORMANCE TESTING AND RELATIONSHIP TO LOWER EXTREMITY INJURY INCIDENCE IN ADOLESCENT SPORTS PARTICIPANTS

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ABSTRACT

Background: Due to the high number of adolescent athletes and subsequent lower extremity injuries, improvements of injury prevention strategies with emphasis on clinic-based and practical assessments are warranted.

Purpose: The purpose of this study was to prospectively investigate if a battery of functional performance tests (FPT) could be used as a preseason-screening tool to identify adolescent athletes at risk for sports-related acute lower extremity injury via comparison of injured and uninjured subjects.

Methods: One hundred adolescent volleyball, basketball and soccer athletes (female, n = 62; male, n = 38; mean age = 14.4 ± 1.6) participated. The FPT assessment included: triple hop for distance, star excursion balance test, double leg lowering maneuver, drop jump video test, and multi-stage fitness test. Composite scores were calculated using a derived equation. Subjects were monitored throughout their designated sport season(s), which consisted of a six-month surveillance period. The schools certified athletic trainer (ATC) recorded all injuries. Subjects were categorized into groups according to sex and injury incidence (acute lower extremity injury vs. uninjured) for analysis.

Results: Mean FPT composite scores were significantly lower for the injured compared to the uninjured groups in both sexes (males: 19.06 ± 3.59 vs. 21.90 ± 2.44; females: 19.48 ± 3.35 vs. 22.10 ± 3.06 injured and uninjured, respectively)($p < .05$). The receiver-operator characteristic analysis determined the cut-off score at ≤20 for both genders (sensitivity = .71, specificity = .81, for males; sensitivity = .67, specificity = .69, for females)($p < .05$) for acute noncontact lower extremity injuries. Significant positive correlations were found between the FPT composite score and the multi-stage fitness test in male subjects ($r = .474$, $p = .003$), suggesting a relationship between functional performance, aerobic capacity, and potential injury risk.

Conclusion: A comprehensive assessment of functional performance tests may be beneficial to identify high-injury risk adolescents prior to athletic participation.

Keywords: Adolescent, injury risk, pre-participation, screening

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