Abstract

INTRODUCTION: Limited data exist on the reliability and sensitivity of the 40-yard dash (40-yd) and vertical jump (VJ) tests in youth athletes, which are popular combine performance assessments. PURPOSE: To examine the test-retest reliability for the 40-yd and VJ in youth athletes. METHODS: Seventy-seven 5- to 15-year-old athletes (mean height = SD = 153.0 cm ± 24.9, weight = 43.8 kg ± 16.3) volunteered for the performance assessments during two visits separated by 24-72 hours. All tests were divided into three age groups (5-9, 10-11, and 12-15 years old). The 40-yd was assessed in seconds (s) with a digital timing gate and the VJ was assessed in centimeters (cm) with a Vertec, both performed on indoor field turf. Intra-class correlation coefficients (ICC) with corresponding 95% confidence intervals, standard errors of measurement (SEM), coefficients of variation (CV), and minimum detectable changes (MDC) were calculated from the repeated measures analysis of variance (ANOVA) from test 1 to test 2 for both assessments. RESULTS: There were systematic decreases in 40-yd times from test 1 to test 2 for the 12 to 15-year-old group, but these were no other detectable systematic variability for any other variable. The ICCs ranged from 0.78 to 0.96, which were greater than zero. MDCs (calculated from SEMs) for the 5-9, 10-11, and 12-15 age groups were 0.49, 0.70, and 0.74, respectively. CVs for the 40-yd and VJ, respectively, were necessary for individual youth athletes to consider their improvements "real" beyond the errors of the measurements.

Conclusions

- There were significant differences among the means for all age group comparisons except for VJ for 10 to 11-year-olds compared to 12 to 15-year-olds and BMI for 5 to 9-year-olds compared to 10 to 11-year-olds.
- Systematic variability was present for 12 to 15-year-olds in the 40-yard dash, but was not present for any other variable.
- Relative reliability was greater than zero, and ranged from 0.78 to 0.96.
- Absolute reliability was 3.3 to 5.2% for 40-yd and 4.3 to 13.7% for VJ.
- Minimum detectable changes ranged from 0.38 to 0.70 for the 40-yd and 4.3 to 13.7 cm for VJ.
- Two participants demonstrated relatively large increases in VJ from test 1 to test 2 which influenced the relative reliability.

References