

Physical performance and sport-specific skills in elite young soccer players: age-related changes and developmental patterns

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Background

Normative data on physical performance and sport-specific skills in elite young soccer players as well as their interrelationships and age-related changes are essential for talent identification programmes.

Results

Normative data on physical performance variables and skills critical for success in soccer were obtained. It was demonstrated that in each subsequent age group the results of all analysed variables improved significantly ($p < 0.05$). The age-related changes of these parameters exhibited a linear pattern for speed and strength measures and a non-linear pattern for speed dribbling and change of direction tests. Significant correlations were found not only between strength and speed indices, but also between strength, speed and sport-specific skills indices. Strong negative correlations were found between sprint and power tests (e.g. CMJ and Broad Jump). Generalised Additive Models revealed pronounced nonlinear growth patterns for all performance metrics, with pseudo R-squared values ranging from 0.56 to 0.85.

Conclusion

Changes in sport-specific skills crucial for success in football follow non-linear trajectories and correlate with measures such as jump and sprint performance. These findings provide valuable insights into the developmental trajectories of young soccer players, offering guidance for talent identification and training strategies in youth soccer.

Method

This cross-sectional study involved 275 young soccer players aged 8 to 17 years from an elite-level academy. All participants completed the following tests: 30-meter sprint, broad jump, countermovement jump (CMJ), change of direction and speed dribbling tests.