

Introduction

In sports science, there is an underlying belief which suggests that optimal core stability provides a foundation for greater force production in the upper and lower extremities, and is therefore, necessary for high performance [1]. However, the relationship between core stability and performance remains uncertain in professional soccer players.

Therefore, the aim of the present study was to investigate the relationship between core stability and selected strength, sprint and endurance performance factors in professional soccer players.

Methods

24 professional male field players from the first German soccer league (mean \pm SD: age 24.5 ± 4.6 years, body mass index 24.0 ± 1.1 kg·m⁻²) were tested on two strength (one repetition maximum bench press, counter movement jump), three sprint (5 m and 30 m linear sprint, 22 m agility sprint), one endurance (interval shuttle run test) performance factors as well as on core stability during the first week of pre-season preparation.

Players' core stability was assessed with four separate tests (ventral, lateral-left, lateral-right and dorsal) (Figure 1) as described in detail previously [2]. The movement speed was dictated by a metronome (1 Hz) and a stopwatch was used to measure the time subjects were able to perform each test as long as possible. The sum of time measured in all four tests was defined as a variable to represent the core stability of the subjects and was used for statistical analysis.

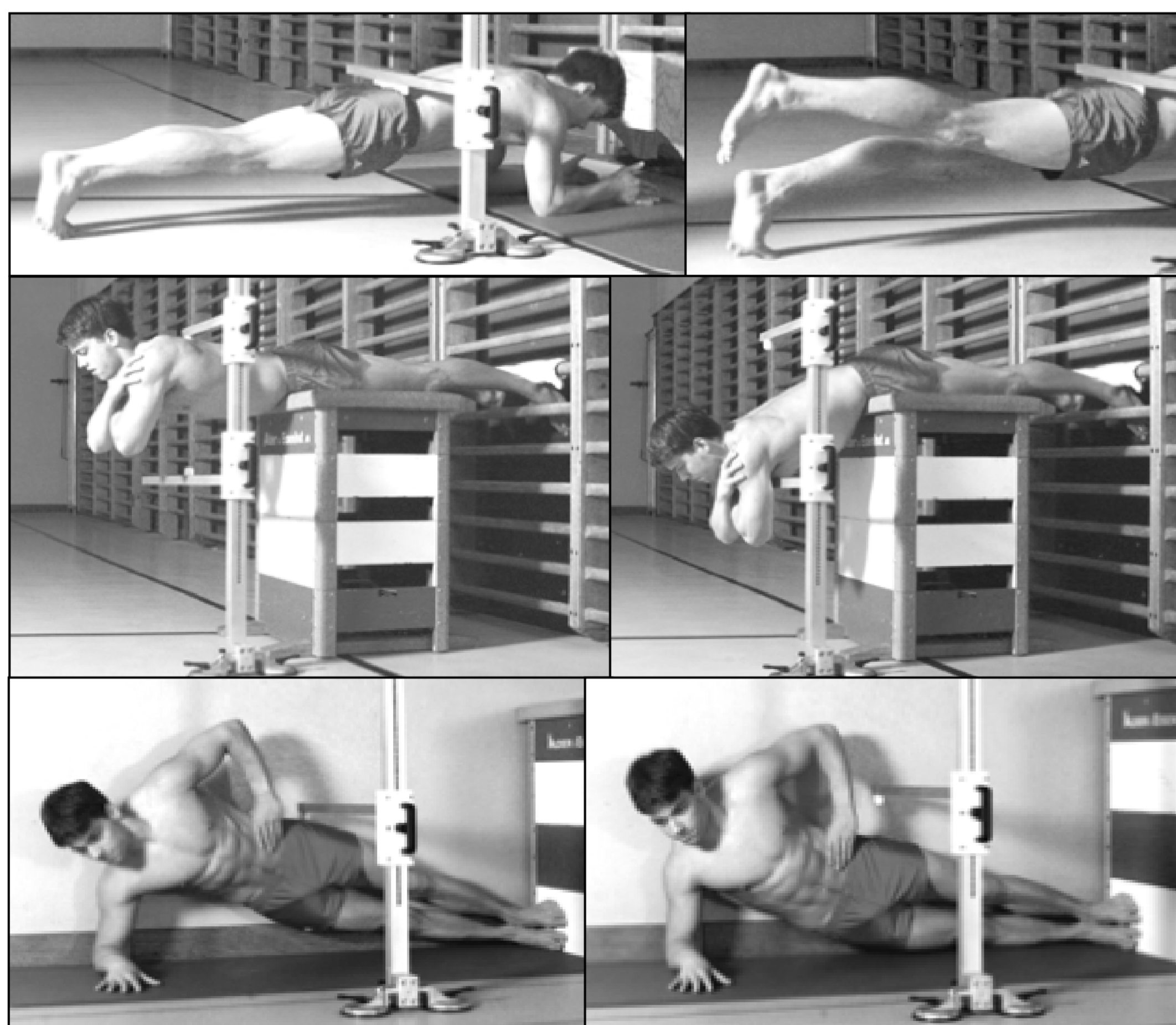


Figure 1. Applied core stability tests: ventral (top), dorsal (middle) lateral (bottom) [2].

Descriptive data (mean \pm SD) were calculated for all variables after checking for normality with the Kolmogorov-Smirnov test. Pearson product-moment correlation coefficients (r) were used to determine the relationships between total core stability and the performance factors. Statistical significance was set up at $p < 0.05$.

Results

Mean \pm SD values for the assessed variables were 86.6 ± 10.4 kg one repetition maximum bench press, 41.7 ± 5.2 cm counter movement jump, 1.07 ± 0.03 s 5 m linear sprint, 4.23 ± 0.15 s 30 m linear sprint, 5.44 ± 0.12 s 22 m agility sprint, 2345.8 ± 172.6 m interval shuttle run test and 432.9 ± 70.0 s core stability.

The correlation analysis revealed no relationships between core stability and selected strength, sprint and endurance performance factors (all $p > 0.05$) in professional soccer players (Figure 2).

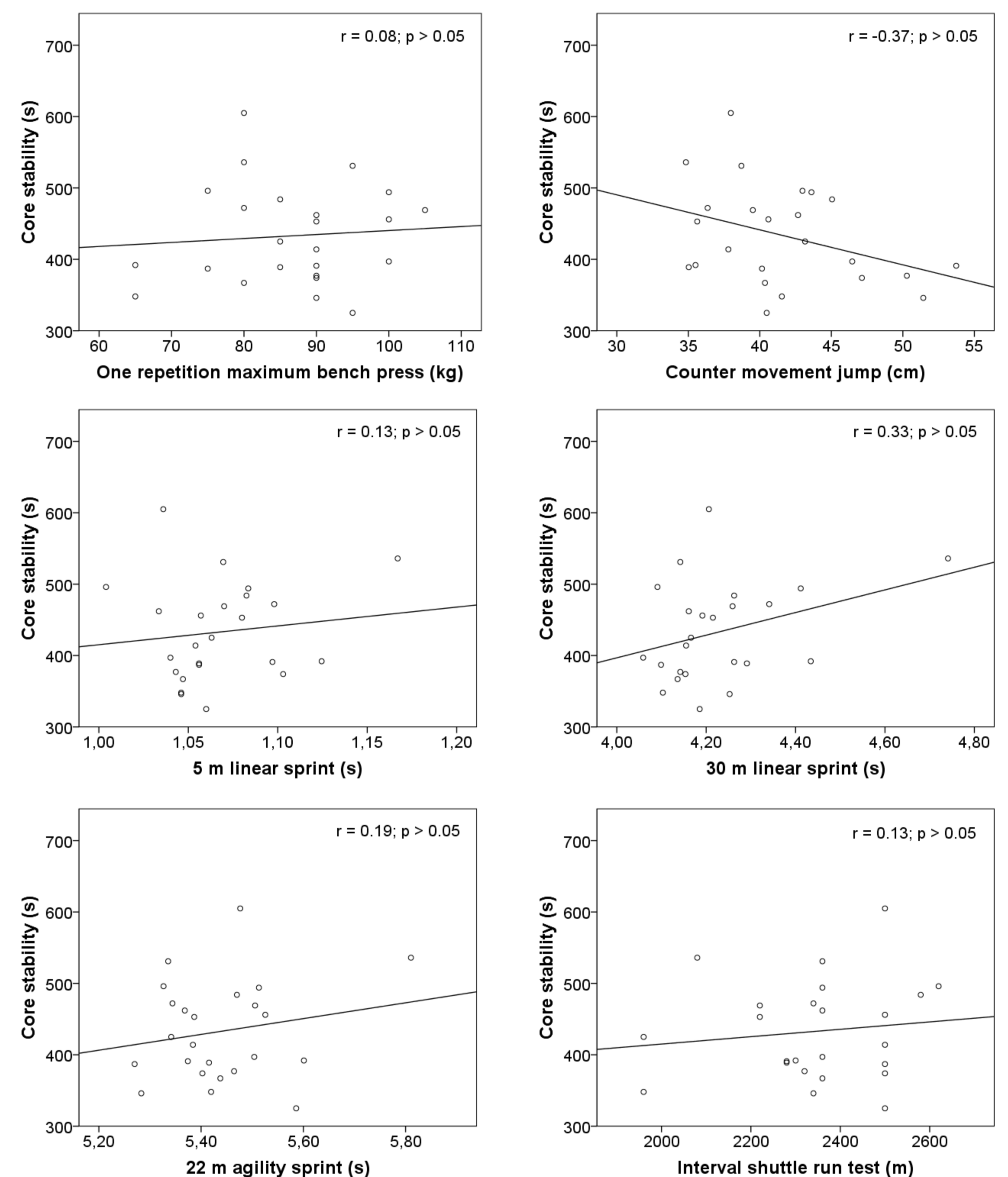


Figure 2. Relationships between core stability and selected strength, sprint and endurance performance factors in professional soccer players.

Discussion

The results of the present study demonstrate that core stability is not related to selected strength, sprint and endurance performance factors in professional soccer players. These observations are supported by previous research in Division I football players [3]. Based on these facts, it seems necessary to reconsider 1) the importance of core stability for high performance in professional soccer players, 2) the applied performance and core stability tests as well as 3) linear statistical analysis methods for biological systems. However, since core stability is not related to performance, future research should focus on the role of core stability for injury prevention and rehabilitation in professional soccer players [4].

References

- [1] Willardson, J. (2007). Core Stability Training: Applications to Sports Conditioning Programs. *JSCR* 21(3): 978-985.
- [2] Tschopp, M. (2003). Manual Leistungsdiagnostik Kraft. Swiss Olympic Medical Centers, 1-62.kleiner/gleich sein
- [3] Nesser, T., Huxel, K., Tincher, J. and Okada, T. (2008). The Relationship between Core Stability and Performance in Division Football Players. *JSCR* 22(6): 1750-1754.
- [4] Borghuis, J., Hof, A.L. and Lemmink, K. (2008). The Importance of Sensory-Motor Control in Providing Core Stability. *Sports Med* 38(11): 893-916.

Contact

Matthias Wilhelm Hoppe
 Fuhlrottstraße 10, 42119 Wuppertal, Germany
m.hoppe@uni-wuppertal.de – www.flt.uni-wuppertal.de