

The Relationship Between Planar Biomechanical Adherence in Male Basketball and Football Players.

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ABSTRACT

Performance can be measured in quantity and quality; quantity is the range of motion that the athlete was able to perform, quality is how well the movement was performed. Quality is greater motor control in movement pattern adherence and less compensating motor patterns. Koźlenia and Domaradzki (2021) reported that developing high-quality movement patterns may reduce risk of injury in athletes.

PURPOSE: The purpose of this study was to compare quantity and quality in Division I collegiate basketball players (BB), and Division I collegiate wide receivers (WR). **METHODS:** Participants were male collegiate BB ($n=15$, 21 ± 1.2 yrs., 188.4 ± 7.8 cm, 85.9 ± 8.8 kg) and male WR ($n=18$, 20.0 ± 1.8 yrs., 182.4 ± 7.4 cm, 85.6 ± 9.1 kg). The participants completed a motion analysis using DARI® markerless motion capture system. The range of motion (ROM), as well as kinetic analyses, were performed using both upper and lower body segments, i.e., shoulder abduction, shoulder flexion/extension, vertical jump, and unilateral squats right & left. Compensation movements include bending of the elbow or anterior corona deviation when performing shoulder abduction. Another compensatory movement is landing with high eccentric/concentric knee dynamic valgus when performing vertical jump. A black-box algorithm was used to determine the athletes' quality and performance (quantity) score. A one-way ANOVA was performed comparing quality and quantity scores between BB and WR, with Tukey Post-Hoc adjustment, using IBM-SPSS (v27). **RESULTS:** BB had a significantly higher quality score than WR, (BB: 311.60 ± 36.3 , WR: 276.56 ± 27.6) at $p = 0.003$. WR had a significantly higher quantity score than BB, (WR: 417.17 ± 89.3 , BB: 314.87 ± 56.4) at $p = < 0.001$. **CONCLUSION:** Collegiate basketball players may have greater anatomical motor control when performing ROM, e.g., maintaining movement patterns within specified planes of motion. Staying in the biomechanical specified plane of motion may improve collegiate athletes techniques, which suggests performance will increase and a reduction in injury risk. WR having a significantly higher quantity score than a quality score, may lead to an increased risk of injury.