

## **Predicting In-season Performance from Pre-season Power and Gait Metrics in Collegiate Basketball: Preliminary Evidence**

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### **ABSTRACT**

Power training affects gait patterns. Power training also affects basketball performance. The Efficiency index (EFF) is the most used in-season basketball performance metric in the US. Strength and conditioning coaches measure power output via specific jumping tests. Could the pre-season relationship between power and gait provide additional information in foreseeing performance before the basketball season starts? **PURPOSE:** To a) confirm that pre-season standing broad jump (SBJ) scores correlate with post-season EFF and b) explore if pre-season SBJ scores and pre-season gait metrics (Jumping Point Gap Broad Jump, Stride, and Speed) are correlated. **METHODS:** Participants (n=17) were recruited from a men's and women's NCAA Division 1 basketball team. Spatio-temporal movement parameters were analyzed using the OptoGait. After a controlled warm-up, participants were asked to complete a 30-second treadmill walk and run, sprint 5 meters, and perform a single- and double-leg broad jump. Basketball statistics were downloaded post-season to calculate EFF (EFF = points + rebounds + assists + steals + blocks – missed field goals – missed free throws – turnovers). Zero-order correlations were used to identify the relationship between EFF, SBJ, and the aforementioned gait metrics. **RESULTS:** SBJ was found to be positively correlated with EFF ( $r_{EFF}=.58$ ,  $p=.039$ ). SBJ was also found to be positively correlated with Jumping Point Gap Broad Jump ( $r_{LeftLeg}=.80$ ,  $p<.001$ ;  $r_{RightLeg}=.81$ ,  $p<.001$ ;  $r_{BothLegs}=.87$ ,  $p<.001$ ), Stride ( $r_{Stride}=.58$ ,  $p=.015$ ), and Speed ( $r_{Speed}=.64$ ,  $p=.006$ ). **CONCLUSION:** Our results a) confirm that pre-season SBJ scores correlate with EFF and b) provide preliminary evidence on a possible path model between gait, power tests, and basketball performance with power being the predictor. If the latter is accurate, valid inferences can be drawn in terms of anticipating specific EFF scores before the basketball season starts via power-gait relationships. Our findings support the continuation of data collection. Future, larger-scale studies should test our pilot-study suggestion through mediation analyses. Limitations may include small sample size.