Mid Atlantic Regional Chapter
of the
American College of Sports Medicine

Annual Scientific Meeting, November 1st – 2nd, 2019
Conference Proceedings
International Journal of Exercise Science, Volume 9, Issue 8

Field Based Assessment of Running Metrics

Thomas C. Long, Peri E. Pavicic, Drue T. Stapleton. Rider University, Lawrenceville, NJ

Recreational and competitive running has been linked to positive health outcomes and is a popular method of physical activity. Despite its popularity, 56% of recreational runners and up to 90% of competitive runners sustain a running-related injury (RRI) during the course of training. Examination of running kinematic metrics (i.e. pronation, pronation velocity, impact force, step rate/cadence, etc.) provides opportunities to explore and quantify risk factors related to the development of RRIs and/or performance improvement. The collection of running kinematic data has traditionally been completed in laboratory settings. With the advancement of wearable technology, real-time running kinematic data can be collected during field-based training sessions. **PURPOSE:** The purposes of this investigation were to collect running metric data using wearable technology in a field-based approach and to examine the relationship between running kinematic metrics. **METHODS:** Data were collected using wearable sensors mounted to the laces of running shoes of NCAA Division I distance runners (n=13) during team or individual training sessions during a one-week period. Data collected included impact force, stride length, breaking force, overall impact (Gs), and cadence. Pearson R correlations were used to analyze the relationships between kinematic variables. **RESULTS:** Analysis revealed a negative correlation (r=-.588, p=0.03) between average cadence and impact force. Stride length (r=-.541, p=.056), breaking force (r=.042, p=.891), and average G force (r=-.467, p=.107) were not significantly correlated. **CONCLUSION:** Excessive impact forces cause strain on the musculoskeletal system contributing to the development of injury. Increasing cadence may decrease impact force and therefore, reduce the likelihood of injury. From a training perspective, the use of wearable technology provides researchers, clinicians, and coaches a tool to provide real-time feedback to runners during field-based training.