

GPS APLICATED TO FOOTBALL: RELIABILITY AND ACCURACY

Castellano, J. 1), Casamichana, D. 1), Calleja-González, J. 1) & San Román, J. 1)

1) University of the Basque Country (UPV-EHU), Spain

Keywords: sprint, GPS, reliability, validity.

Introduction

The aim of the present study was to determine reliability and accuracy of global positioning system (GPS) devices that operate with sampling frequency of 10 Hz (*MinimaxX* model from *Catapult Innovations*, Melbourne, Australia). The protocol was carried out followed by repeat sprints of 15 and 30 m. Photoelectric cells were used to measure the durations of the run. All the procedures were recorded with a video camera. For the analysis, the video was synchronized with each of the records of GPS specific application (*Logan Plus* v.4.5).

Methods

Nine trained male athletes participated in the study (Age: 20 ±0.7 years). Each participant completing each 7 and 6 runs of 15 and 30 linear m respectively (n = 117), incorporating only one GPS device per participant. Only we studied the reliability and accuracy in this type of testing to increase the internal validity of the work.

Results & Discussion

The statistic analysis were: the mean (13.2 and 28.1 m), standard deviation (1.4 and 1.4 m), typical error (0.2 and 0.3 m), coefficient of variation (1.3 and 0.7%), bias (11.9 and 6.5%) and standard error of measurement (10.9 and 5.1%), in runs of 15 and 30 m respectively. These results are better comparing the data observed by others devices^{1,2,3}.

Conclusion

1) The increase in the frequency of sampling (10 Hz) has led to an increase in the precision and reliability. 2) The GPS devices studied show a moderate-high precision measuring 15 m fast run, which improves by 30 m. 3) A high inter- and intra-reliability devices was certified what indicates that the above mentioned devices can be exchanged in the training.

References

1. Coutts, A. & Duffield R. (2010). *J Sci Med Sport*, 13: 133-135.
2. Petersen, C. et al. (2009). *Int J Sports Physiol Perform*, 4: 381-393.
3. Duffield, R. et al. (2010). *J Sci Med Sport*, 13: 523-525.

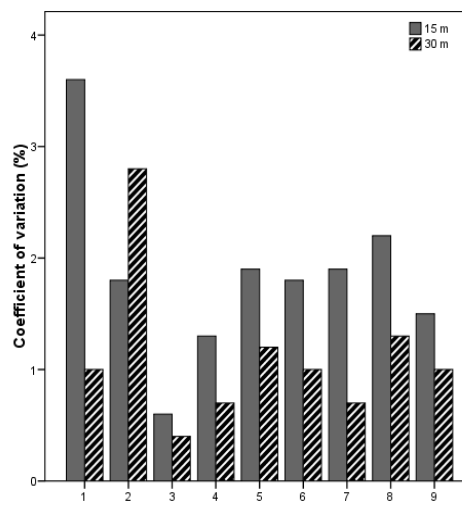


Figure 1. Coefficient of variation by each of the GPS devices in races of 15 and 30 m.