Relationships of internal and external training load in elite-level adolescent soccer

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Background...

GPS research is dominated by locomotor focussed metrics such as total distance and high intensity running - may be affected by tactical approach

Tri-axial accelerometer-derived data is based on instantaneous rate of change in acceleration in each of the three vectors and infers extent of mechanical loading

Combining external load metrics with internal variables such as RPE has been well researched and verified as a method of calculating the physiological dose-response between individuals

Aim: To observe the magnitude of associations between internal and external training load amongst elite-level adolescent soccer players

(Barrett *et al,* 2014; Buchheit and Simpson, 2017; Castillo *et al*, 2016; Halson, 2014; Malone *et al*, 2017; Vanrenterghem *et al*, 2017)

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Experimental Approach...

Participants

n = 34
Male Elite Academy Football Players

Age 13.84 yrs
Weight 55.1 kg
Height 166.9 cm

External Load

catapult.

3 x unaltered training sessions within a two-week period delivered by technical age-group coaches

Catapult S4 (GPS 10Hz & 100Hz accelerometer) to observe High Speed Running & PlayerLoad

Individualised speed thresholds were calculated on Mendez-Villaneuva et al (2012) to consider slower relative speeds for maturing players

Internal Load

Borg CR10 Scale (1982)[12]

0	Nothing at all
0.5	Extremely weak (just noticeable)
1	Very weak
2	Weak (light)
3	Moderate
4	Somewhat strong
5	Strong (heavy)
6	
7	Very strong
8	
9	
10	Extremely strong (almost max)

Habitually used sRPE (CR10) within 15 mins post session

sRPE x Duration (mins) provided Training Load (RPE Load) (AU) (Foster, 1996)

Between subjects correlations were calculated to determine relationships using standardised correlation (Pearson r) thresholds (Cohen, 1988)

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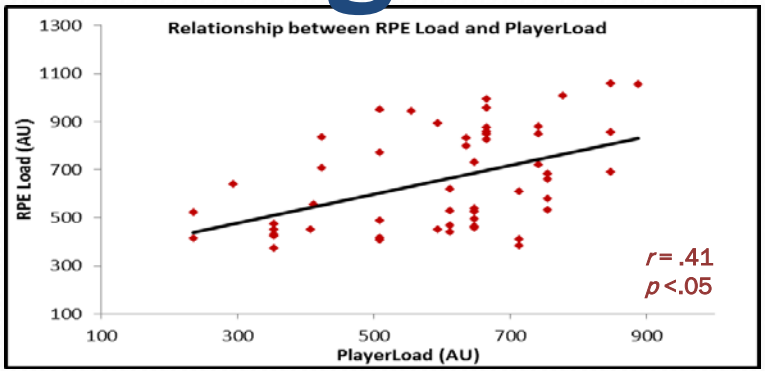
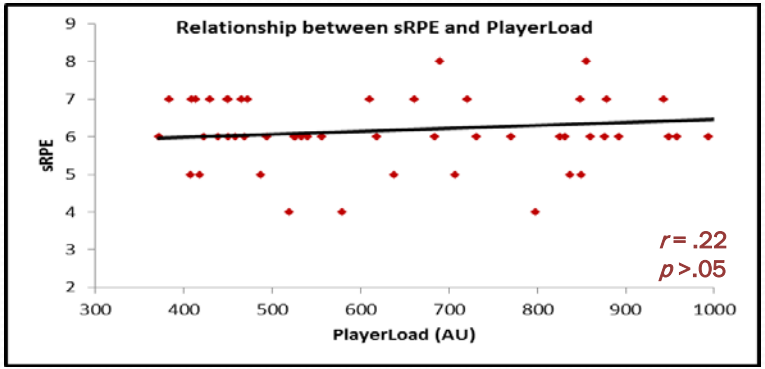
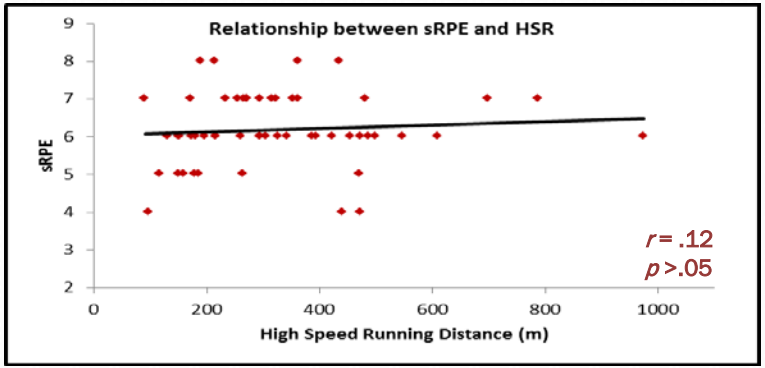
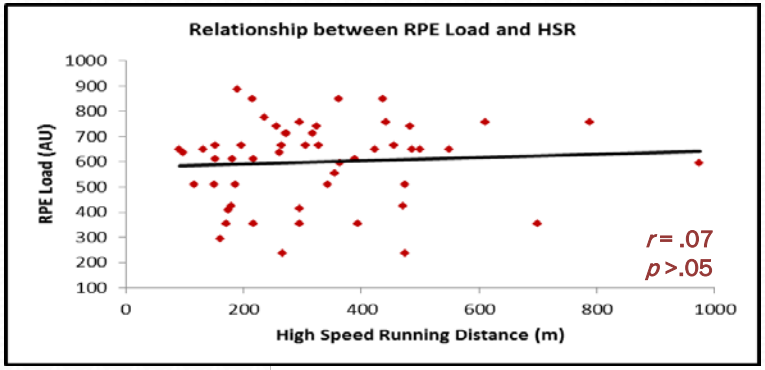
Findings...









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Take Away Messages…

Strongest relationships exist between RPE Load and Tri-axial accelerometer-derived data

Suggests the more energetically demanding, rapid changes in speed are more indicative of how young footballers perceive training intensity than HSR

1

Relatively small relationships between internal and external variables outline the importance of combining approaches where possible

Basing training load monitoring on accessible surrogate of external GPS data may provide poor indication of dose-response experienced

2

Further work is needed to establish solid relationships between internal and external load in adolescent footballers

Evidence suggests that RPE based data is a suitable method to routinely monitor load, however relationships with external load metrics is currently weak

3

Castillo *et al*, 2016; Halson, 2014; Malone *et al*, 2017; Robertson *et al*. 2016

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Thank You for listening

'Gracias por escuchar'

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