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Determining high intensity activity in women's rugby union: Use of current male-derived absolute speed thresholds underestimates true levels

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Background

- Absolute speed thresholds commonly used due to easy of application across a whole team (Dwyer & Gabbett, 2012).
- The use of GPS-based movement data in elite women's rugby union is gaining in popularity.
- Speed thresholds are currently based on data derived from the men's game for example Cunniffe et al. (2009), with High Intensity running equating to speeds of 18-21 km.h^{-1} and Sprinting to speeds of >21 km.h^{-1}.
- Reported maximum speeds achieved by female players are 2-6 km.h^{-1} slower (Suarez-Arrones et al., 2014, Virr et al., 2014) than reported for male players (Cahill et al., 2012).
- Use of male derived thresholds likely to under-estimate high intensity movement distances where absolute thresholds are used. For example: female Rugby 7's (Clarke et al., 2014).

AIM:

To examine the effect of reducing the absolute speed thresholds on the volume of high speed running and sprinting in women's 15 –a-side rugby.

Protocol

58

5 Games

GPS

Measures

High intensity running (HIR) and sprint (Spr) zones
Max Velocity – Only 41% of players who participated in this study achieved speeds greater than 21 km.h^{-1}
Mean velocity – 20.73±3.4 km.h^{-1}
4 – 8 km.h^{-1} lower than male players (Cunniffe et al., 2009; and Coughlan et al., 2011)

Thresholds

Absolute
Cunniffe et al (2009) – Male-derived
Zones: HIR 18-21 km.h^{-1}; Spr > 21 km.h^{-1}
Distance: 63 m; 30 m
% Time: 0.12%; 0.03%

Absolute-2
Absolute reduction of 2 km.h^{-1}
Zones: HIR 16-19 km.h^{-1}; Spr > 19 km.h^{-1}
Distance: 139 m*; 60 m*
% Time: 0.41%*; 0.07%
* Indicates significantly different from Absolute

Absolute-4
Absolute reduction of 4 km.h^{-1}
Zones: HIR 14-17 km.h^{-1}; Spr > 17 km.h^{-1}
Distance: 239 m*; 71 m*
% Time: 0.88%*; 0.36%*

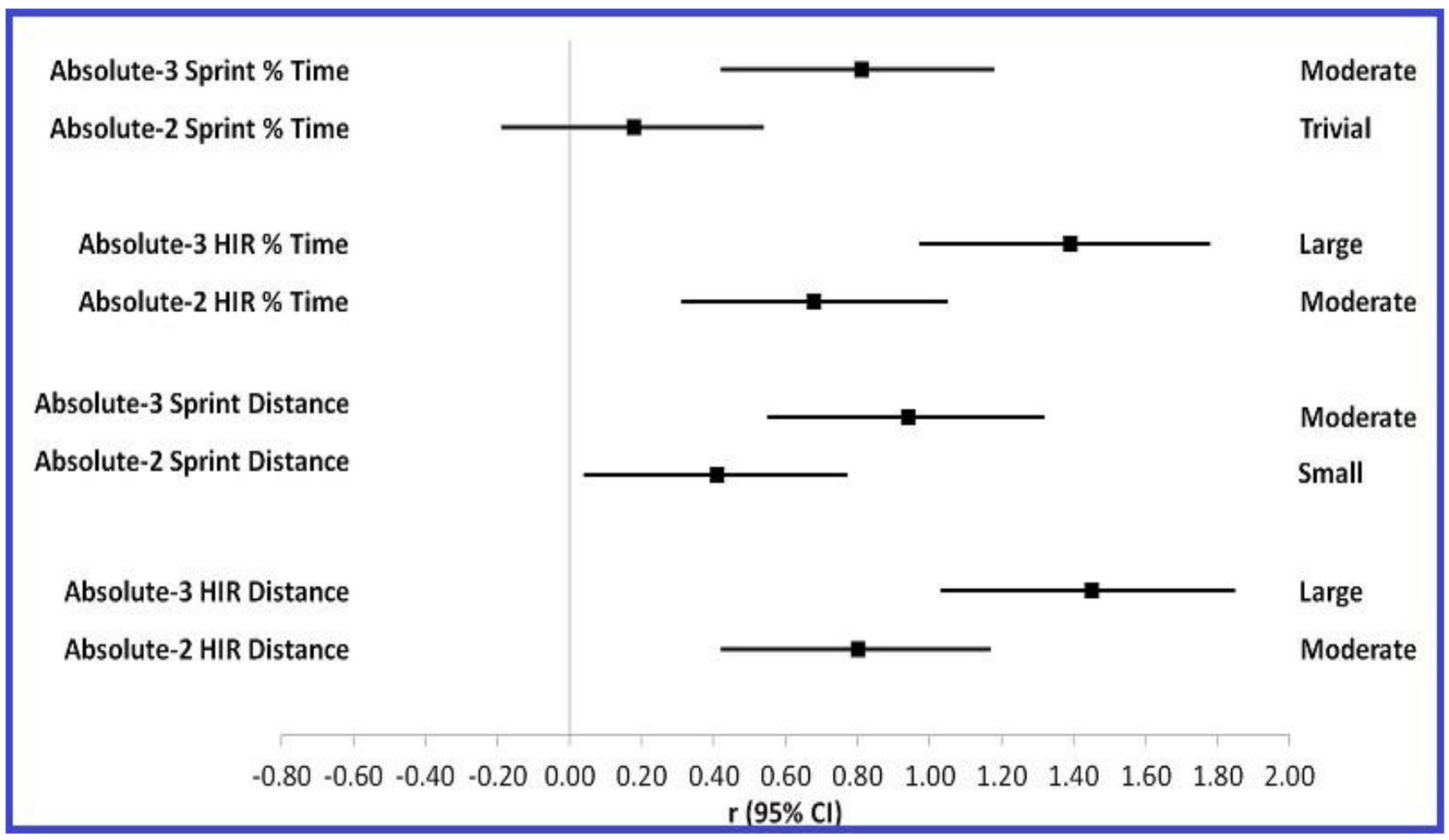

Figure 1: Magnitude of effect size change (Hopkins et al., 1999) from reference thresholds (Absolute)

Conclusions

- Increases in distances and % time spent at high intensity running and sprinting were observed as expected.
- Female players mean max velocity is lower than the male-based sprinting threshold speed.
- Absolute-2 high intensity running and sprinting distances are similar to those observed in women's international game (Suarez-Arrones et al., 2014).
- Volume of high intensity running and sprinting distances align more closely with those observed male English Premiership rugby (Cahill et al., 2013) when speed thresholds are reduced.
- Time spent at high intensity activity still lower than reported by Virr et al. (2014) using video-based time-motion analysis.
- Preliminary findings indicate that female-specific speed thresholds should be utilised in future when applying absolute threshold zones to a team analysis, as existing male-derived thresholds appear to underestimate the movement patterns of female players.

References

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