

The Implications of Lower-Limb Symmetry within Freestyle Wrestlers during an Offensive reshot

Teo Pouri-Lane and Dr Peter S. Maulder

Centre for Sport Science and Human Performance, Wintec, Hamilton, New Zealand (2018)



Introduction

In the sport of freestyle wrestling, it is advantageous to be able to initiate attacks from both sides of the body. Limb symmetries are perceived to positively effect an individual's ability to perform adequately using either side of the body (Jordan & Herzog, 2015). There is currently limited research relative to limb symmetries and wrestling, thus the purpose of this study was to determine lower-limb asymmetries within freestyle wrestlers and its impact on there wrestling performance in order to further knowledge within this area.

Methods

Participants

Ten competitive male and female wrestlers (Mean \pm SD; age: 22.3 \pm 3.9 y, body mass: 75.7 \pm 9.4 kg, height: 172.2 \pm 8.6 cm) volunteered to participate.

Data collection

The participants were required to complete a unilateral bound test, a crossover hop test and a double-leg re-shot performance test. The participants were familiarised with the tests before completing three trials on each leg for each test with approximately two minutes rest between trials.

Statistical procedures

Descriptive statistics (means and standard deviations) were calculated for the performance measures. Differences between the preferred and non-preferred legs were defined using effect sizes and percentage differences (Nagakawa & Cuthill, 2007)

Results

Table 1: Differences between shoot-reshoot performance and unilateral power metrics (Preferred – Non-preferred), including qualitative inferences about the effects of those differences.

Metric	Non-Preferred	Preferred	P value	% Diff, \pm 90%CL	Effect size
	Mean \pm SD	Mean \pm SD			
Unilateral Horizontal bound (cm)	185.7 \pm 35.0	207.1 \pm 36.8	0.0004*	11.7, \pm 3.8	0.54 (S)
Crossover hop (cm)	440.1 \pm 115.2	458.6 \pm 93.7	0.195	5.6, \pm 7.4	0.18 (T)
Shoot-Reshoot Shot 1 (s)	1.142 \pm 0.165	1.150 \pm 0.173	0.919	0.6, \pm 12.0	0.04 (T)
Shoot-Reshoot Transition (s)	0.234 \pm 0.189	0.275 \pm 0.188	0.640	11.3, \pm 50.1	0.11 (T)
Shoot-Reshoot Shot 2 (s)	1.445 \pm 0.361	1.468 \pm 0.306	0.730	2.9, \pm 16.0	0.09 (T)
Shoot-Reshoot Total (s)	2.820 \pm 0.387	2.847 \pm 0.312	0.785	1.3, \pm 8.8	0.08 (T)

* Significant difference P < 0.050; Diff. = Difference; CL = Confidence limits; S = small; T = trivial

Table 2: The relationships between horizontal power and the shoot-reshoot initial shot performance.

	Shoot-Reshoot Non-pref shot 1	Shoot-Reshoot Pref shot 1
Non-Preferred	0.472	-0.336
Preferred	0.510	-0.133
Asymmetry	-0.006	0.543

Table 3: The relationships between crossover power and the shoot-reshoot transition time.

	Shoot-Reshoot Non-pref transition	Shoot-Reshoot Pref transition
Non-Preferred	-0.232	-0.647
Preferred	-0.368	-0.612
Asymmetry	-0.165	0.417

Findings

The results of the study identified trends that suggested an overall greater performance when the wrestlers used their preferred leg during the tests. The horizontal bound test found asymmetries within the participants which correlated largely with the preferred double leg shot (r = 0.543). This finding indicated that the dominant leg (preferred leg) produced a faster time during the shoot-reshoot which is in accordance of current literature and wrestling knowledge (Dorge et al, 2002).

Further research is required to further our knowledge into limb symmetry and its implications in freestyle wrestling.

Practical applications

The findings within this study can be used to:

- Develop coaching strategies to achieve optimal performance.
- Identify performance differences between the two sides of the body.

References

- (1) Dorge, H., Andersen, T., Sorensen, H. & Simonsen, E. (2002). Biomechanical differences in soccer kicking with the preferred and the non-preferred leg. *Journal of Sports Sciences*, 20(4), 293-299
- (2) Jordan, M. & Herzog, W. (2015). Lower limb asymmetry in mechanical muscle function: A comparison between ski racers with and without ACL reconstruction. *Scandinavian Journal of Medicine & Science in Sports*, 25(3), 301-309.
- (3) Nakagawa, S. & Cuthill, I. (2007). Effect size, confidence interval and statistical significance: a practical guide for biologists. *Biological Reviews*, 82(4), 591-605.

Acknowledgement

