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INTRODUCTION

- Isometric Mid-Thigh Pull (IMTP) is a reliable, simple, and relatively quick assessment of force generation capacity.
- Grip strength is believed to be a limiting factor in IMTP performance; however, little is known about the effects of grip variations on IMTP net peak force (NPF).
- Standardized methodology will help increase IMTP utilization and improve interpretation of research findings.

PURPOSE

This study aimed to assess the influence of lifting straps and grip variations on IMTP performance.

METHODS

Total Subjects	Male/Female	Age	Mass	Height	Training Age
29	9/20	30.3±6.9 yrs	77.1±10.9 kg	171.1±3.3 cm	med: 5.5 yrs

SUBJECTS (Table 1)

- 29 healthy subjects
 - 9 male
 - 20 female
- Physically active adults (NASA Activity Scale)
- No chronic musculoskeletal complaints

PROTOCOL

- Grip strength (3 trials each hand)
- Four grip conditions (See Figure 1. Grip variations)
 - Pronated, unstrapped (PRO)
 - Mixed, unstrapped (MIX)
 - Traditional straps (TRAD)
 - Figure 8 straps (F8)

Subjects completed one strapped and one unstrapped condition on two testing days in a randomized, counterbalanced order

STATISTICAL ANALYSIS

- Differences in NPF by grip type: Analysis of Variance (ANOVA)
- Paired t-tests post-hoc determined pairwise differences
- Effect sizes: Hedge's *g*
 - *Small* (< 0.2)
 - *Moderate* (0.2-0.5)
 - *Large* (> 0.8)

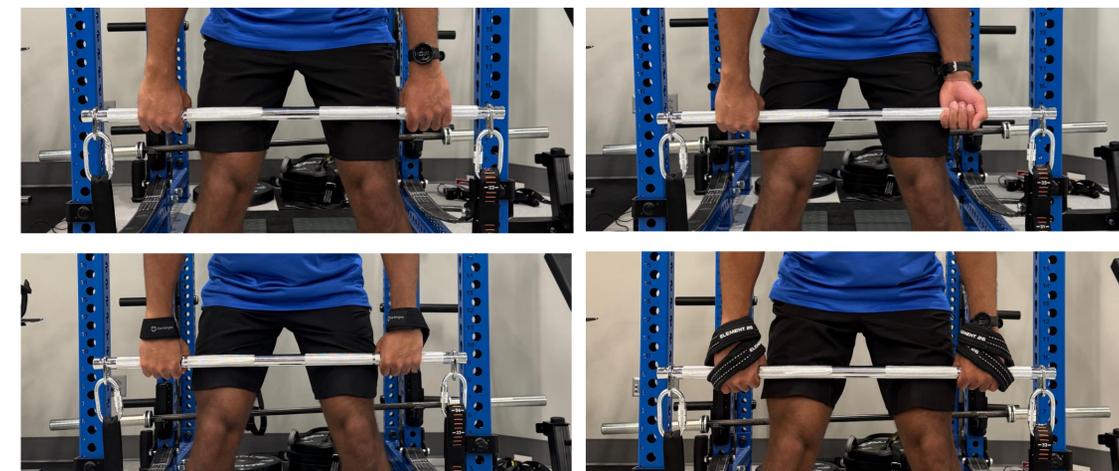
RESULTS

- NPF was significantly greater in strapped (TRAD, F8) than unstrapped (PRO, MIX) conditions ($p < .05$)
- No significant difference in NPF by type of lifting strap used (TRAD, F8) or type of unstrapped grip (PRO, MIX)
- The use of lifting straps had a moderate to large effect on NPF.

Table 2. Descriptives and Pairwise Comparisons

Condition	Mean [SD]	Condition	p	Hedge's <i>g</i>	Interpretation
Figure 8 (F8)	1476 [433]	PRO	<0.01	$g = -0.892$	Large
		MIX	<0.01	$g = -0.737$	Moderate
		TRAD	0.390	$g = -0.166$	Very small
Traditional (TRAD)	1445 [507]	F8	0.390	$g = 0.166$	Very small
		PRO	0.046	$g = -0.604$	Moderate
		MIX	0.004	$g = -0.398$	Small
Mixed (MIX)	1332 [389]	F8	<0.01	$g = 0.737$	Moderate
		TRAD	0.046	$g = 0.398$	Small
		PRO	0.156	$g = -0.277$	Small
Pronated (PRO)	1283 [366]	F8	<0.01	$g = 0.892$	Large
		TRAD	0.004	$g = 0.604$	Moderate
		MIX	0.156	$g = 0.277$	Small

Figure 1. Grip variations
Unstrapped pronated (PRO, top left), unstrapped mixed (MIX, top right), traditional strapped (TRAD, bottom left), figure-8 straps (F8, bottom right)



CONCLUSIONS

- Lifting straps are important to fully quantify total pulling strength, however the type of strap used has a very small, non-significant effect on IMTP NPF.
- Differences between pronated vs mixed grip and Figure 8 vs traditional straps were not significant and the effect was small.

PRACTICAL APPLICATIONS

- Lifting straps are important to quantify total pulling strength from an IMTP.
- Unstrapped IMTP may be a useful tool in identifying group rankings or changes, but it does not provide an adequate measure of total pulling strength.
- Coaches should take athlete preferences into consideration when determining between either strapped condition (or unstrapped condition when straps are unavailable).

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