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**Grip strength is associated with marksmanship and defensive tactics, but not injuries, in police recruits**

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**<sup>1</sup>Bond University, Gold Coast, Australia.**

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# INTRODUCTION



- **Question:** How important is grip strength in police?

	AFP	NSW Pol	VIC Pol	Q POL	NT POL	TAS Pol	NZ Pol	UK Pol	Metro Pol LA / Reno	ADF	Fire
<b>Male</b>	<del>40 nd: 45 d</del>	30*	30*	N/A	N/A	45*	96 (L+R)	<del>32*~</del>	36*	N/A	N/A
<b>Female</b>	<del>30 nd: 35kg d</del>	30*	30*	N/A	N/A	25*#	52 (L+R)	<del>32*~</del>	36*	N/A	N/A

nd = non-dominant hand: d = dominant hand

\* each hand

~ removed from assessment protocol-No longer used.

# 39 years and younger. 40 and over = 24 kg

# INTRODUCTION



- **Question:** How important is grip strength in police?
  - For marksmanship?



# INTRODUCTION



- **Question:** How important is grip strength in police?
  - For defensive tactics?



# INTRODUCTION



- **Question:** How important is grip strength in police?
  - As a predictor of injury?



# METHODOLOGY



- **Outcome Measures - Grip Strength:**

- \* Grip Strength taken in conjunction with other fitness measures by NSW Police PTI within Week 1
- \* Protocols described by Dortkaph (1987) with grip dynamometer



# METHODOLOGY



- **Outcome Measures - Injury:**

- \*Injury results as recorded on the police injury database using a standard issue form were collected 4 weeks after course completion.

- \*Only injured / not injured status was recorded

- \* Serious enough for the recruit to have sought treatment



# METHODOLOGY



- **Outcome Measures - DefTac:**

\*Defensive tactics performance as determined by training instructors (Pass/Fail)



# METHODOLOGY



- **Outcome Measures - Marksmanship:**



\*Marksmanship performance (static) with 9 mm Glock pistol fired from dominant hand on a Z4 target.

\*Scores as allocated on the target

# RESULTS



- **Descriptive data**

<u>Group</u>	<u>N</u>	<u>Mean</u>
Session 1	50	43.64 ± 9.8 kg*
Session 2	169	42.15 ± 8.3 kg* **

\*Injury data

\*Deftac and Marksmanship data

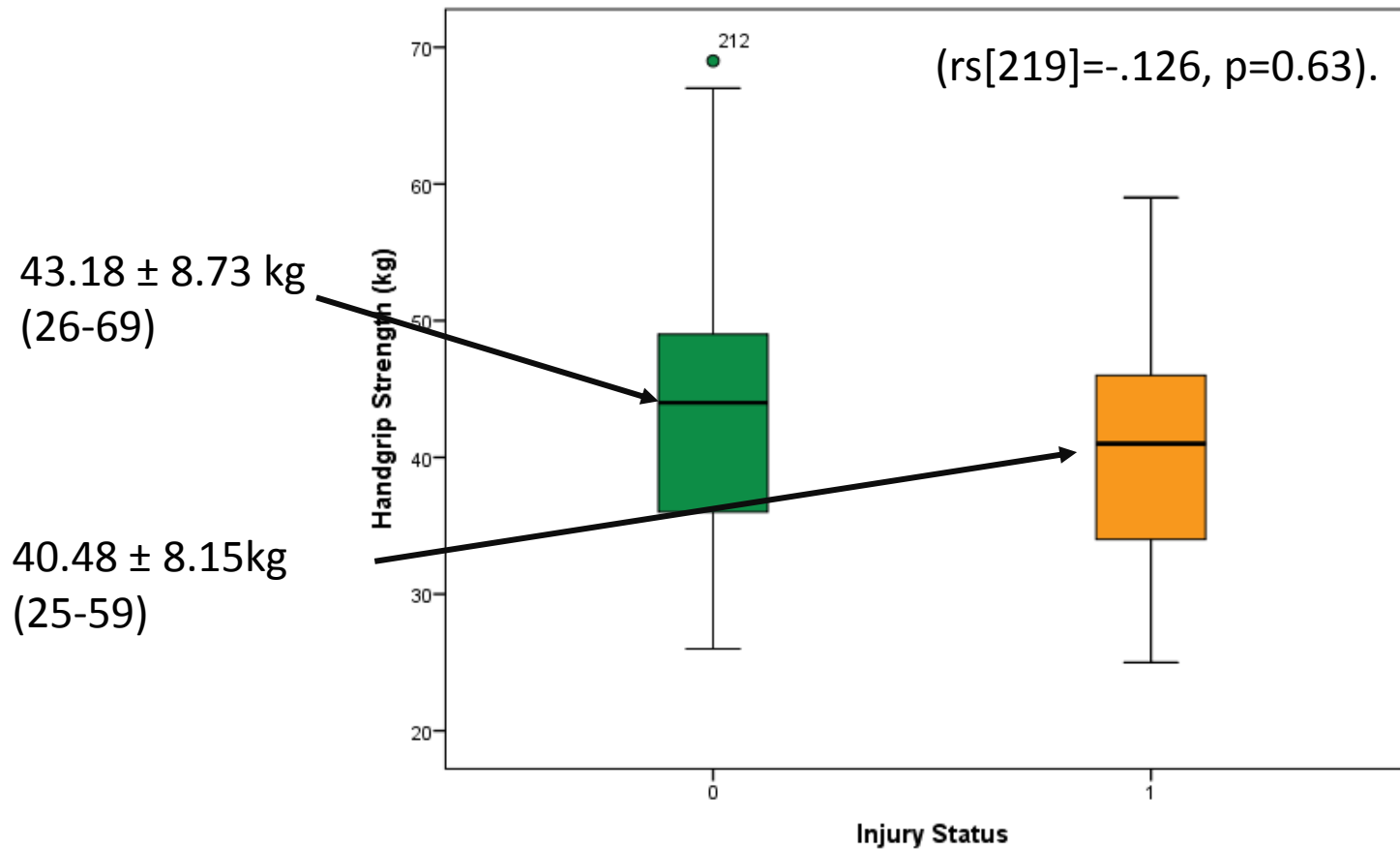
No significant difference between groups ( $p=0.287$ ).

# RESULTS



- **Grip Strength and Injury**

- 26% (n=56) sustained an injury

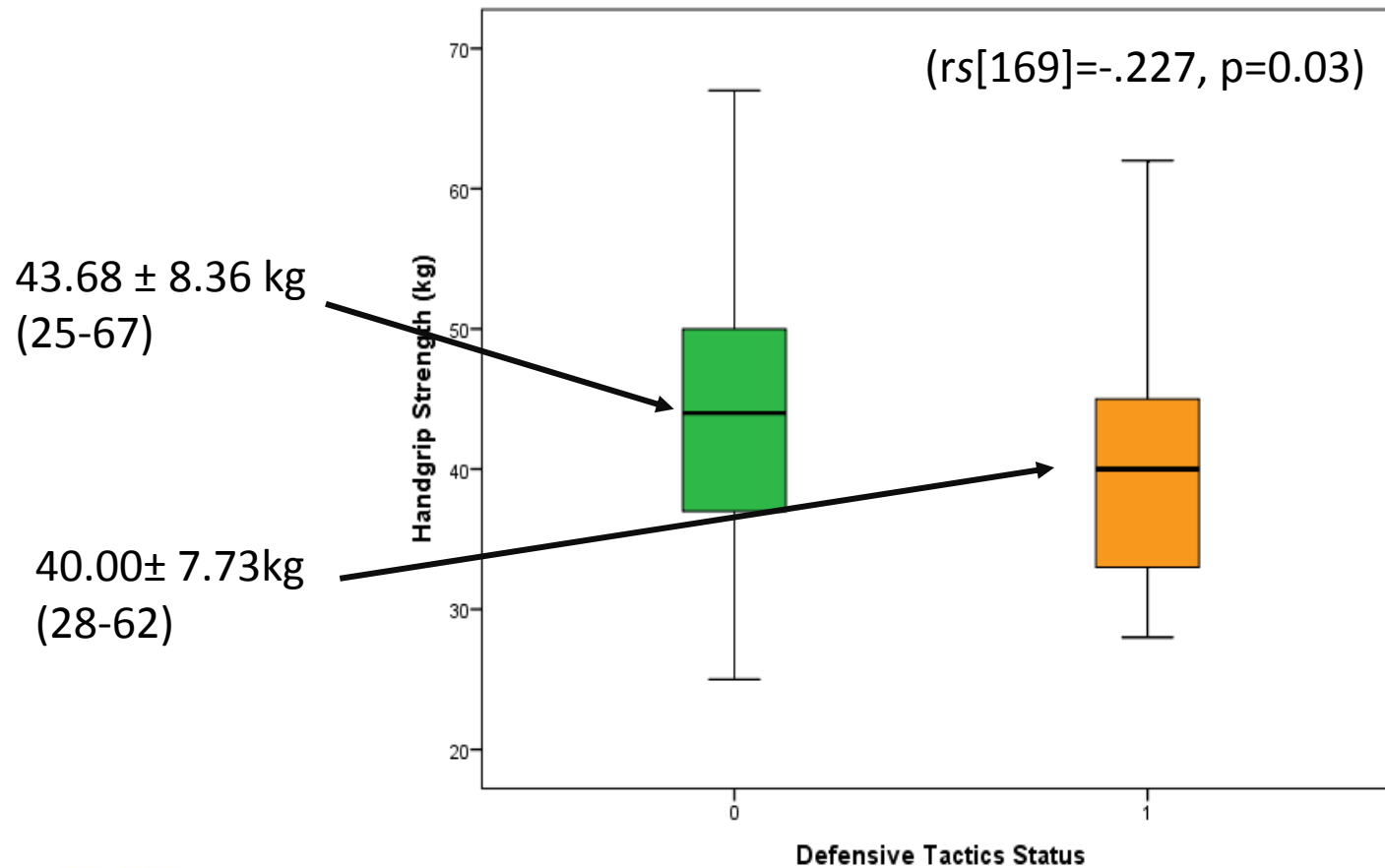


# RESULTS



- **Grip Strength and Deftac**

- 41% (n=70) failed

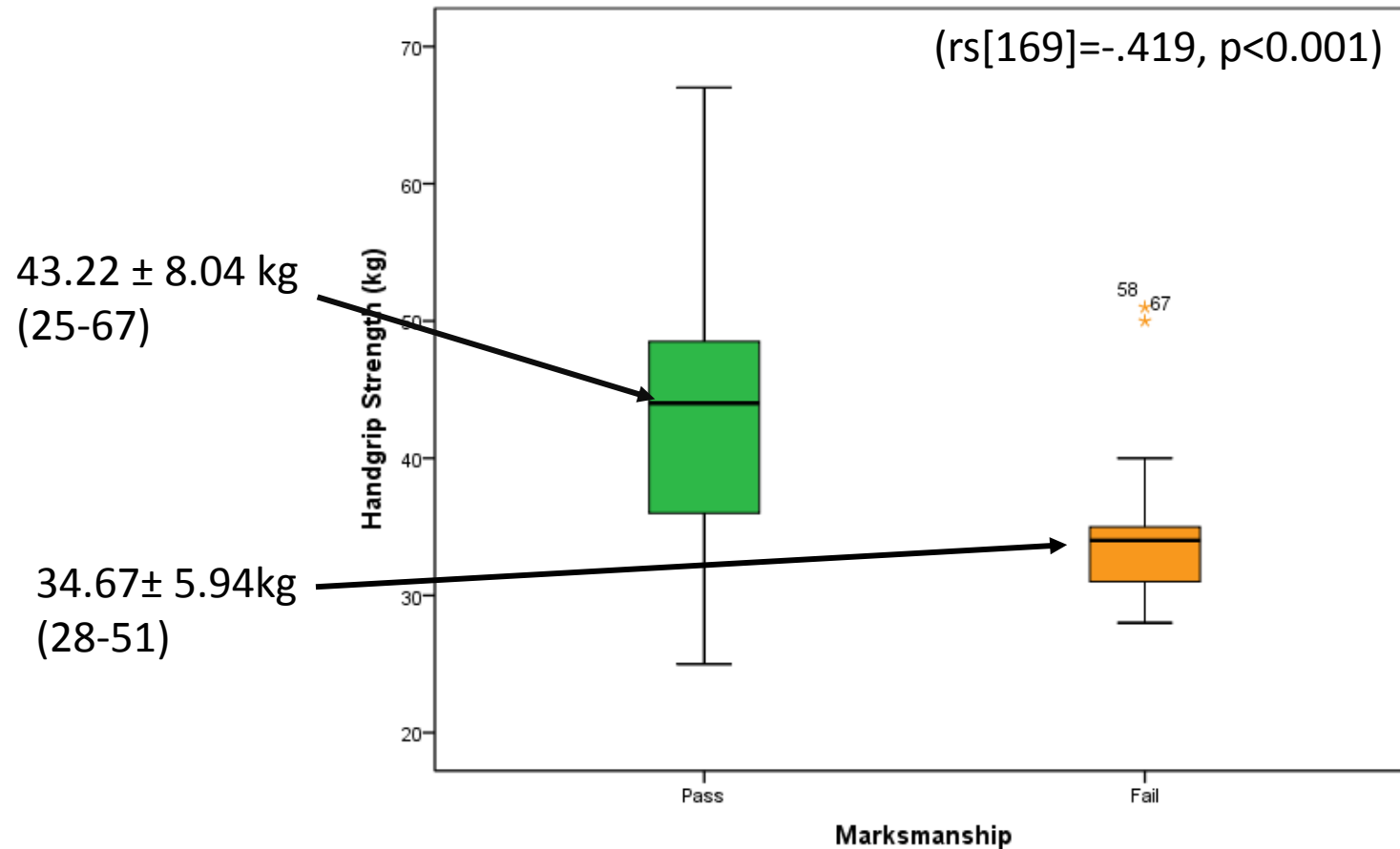


# RESULTS



- **Grip Strength and Marksmanship**

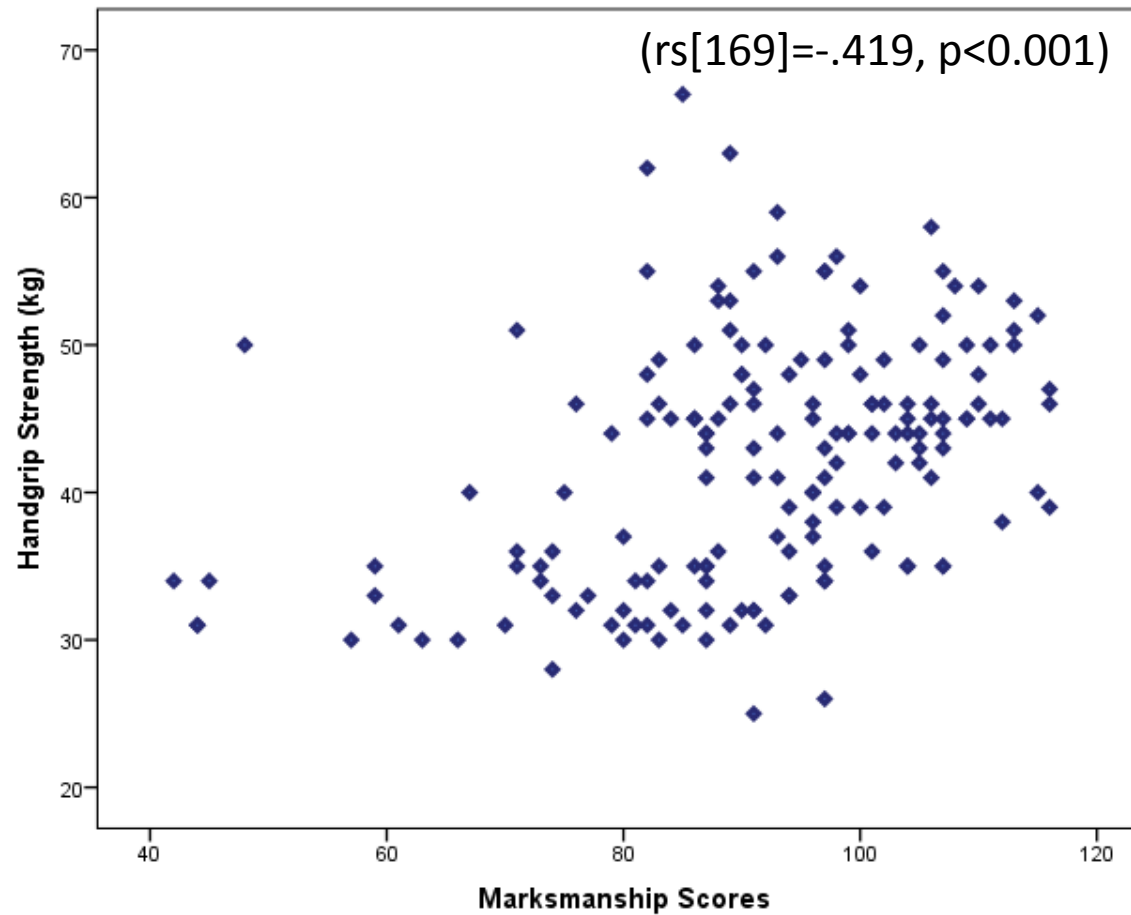
- 12% (n=21) failed



# RESULTS



- **Grip Strength and Marksmanship**



# DISCUSSION



## Injury Findings

-Supports previously unpublished research findings in this population

- This research as a predictor of acute injury and does not take into account long term health and mortality (Bohannon, 2008; Rantanen et al., 1999; Sasaki, Kasagi, Yamada, & Fujita, 2007; Sayer et al., 2006)



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# DISCUSSION



## Deftac findings

- Supports subjective reports by officers
- Influenced by technique?



# DISCUSSION



## Marksmanship findings

### -Supports findings of majority of research

- (Anderson & Plecas, 2000; Copay & Charles, 2001; Vercruyssen, Christina, Muller, & Grose, 1988)

### -Influenced by technique

- (Copay & Charles, 2001)

### -Use in safety and capability?



# CONCLUSIONS



- Grip strength may not predict injury risk in police officers undergoing recruit training
- Grip strength may play a role in the marksmanship and defensive tactics performance of police recruits, however its relationship with these tasks is not strong enough to provide a predictive value.

# CLINICAL RELEVANCE



- Grip strength may influence a police recruit's marksmanship and defensive tactics performance.
- Optimising grip strength following injuries that affect a police recruit's grip strength is important.
- Grip strength may be a useful outcome measure in return-to-training planning for police officer recruits undergoing treatment for upper limb injuries.



# LIMITATIONS & FUTURE RESEARCH



- Injury data depth

- Need to investigate with greater depth, ie type, area, mechanism

- Gender (limited data)

- Potential benefit of reviewing by gender as opposed to gender neutral performance only

- Glock 17

- Variations? (M4, Beretta 92, etc)



# LIMITATIONS & FUTURE RESEARCH

- Grip strength measures

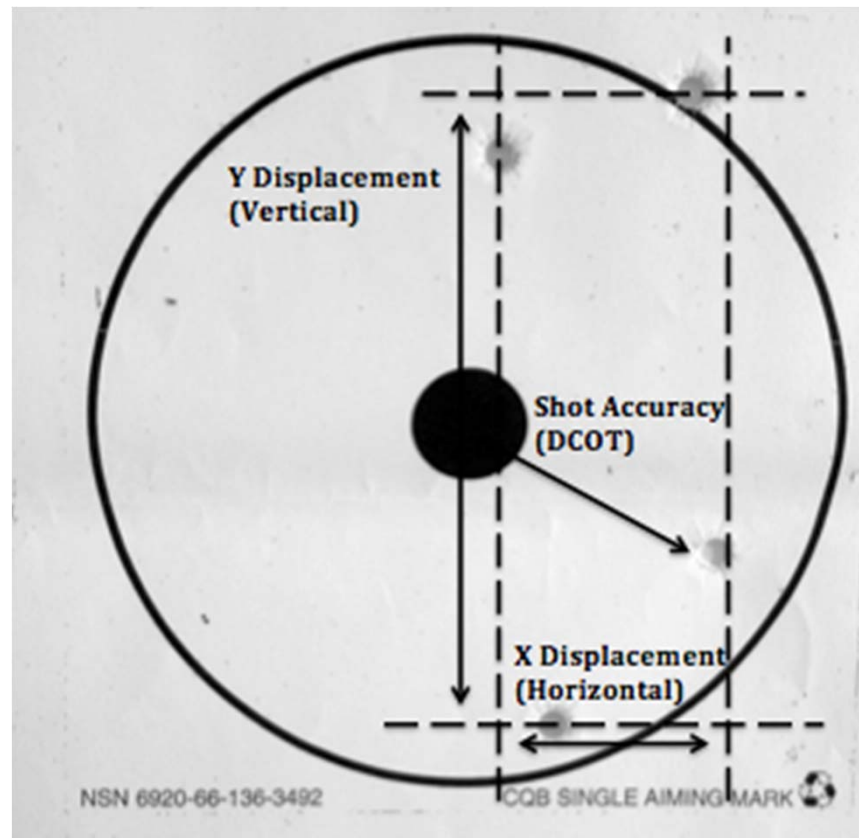


Greater synergy than current protocol

Different length-tension relationships of forearm musculature

# LIMITATIONS & FUTURE RESEARCH

- Marksmanship measures points based  
→ marksmanship based on DCOT,  $X_d$ ,  $Y_d$ .



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# REFERENCES



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