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

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

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<th>NSW Pol</th>
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<td>40 nd:</td>
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<tr>
<td></td>
<td>45 d</td>
<td>30*</td>
<td>30*</td>
<td>N/A</td>
<td>N/A</td>
<td>45*</td>
<td>96</td>
<td>L+R</td>
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<td>25*#</td>
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<tr>
<td></td>
<td>35kg</td>
<td>30*</td>
<td>30*</td>
<td>N/A</td>
<td>N/A</td>
<td>32*~</td>
<td>36*</td>
<td>N/A</td>
<td></td>
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</tr>
</tbody>
</table>

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?

Grip strength is associated with marksmanship and defensive tactics, but not injuries, in police recruits
Orr RM, Stierli, M, Hinton, B. Steele, M
INTRODUCTION

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

Grip strength is associated with marksmanship and defensive tactics, but not injuries, in police recruits
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• **Question:** How important is grip strength in police?
  - As a predictor of injury?

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METHODOLOGY

• **Outcome Measures - Grip Strength:**
  
  * Grip Strength taken in conjunction with other fitness measures by NSW Police PTI within Week 1
  
  * Protocols described by Dortkamph (1987) with grip dynamometer
• **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)*
• **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

<table>
<thead>
<tr>
<th>Group</th>
<th>N</th>
<th>Mean</th>
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</thead>
<tbody>
<tr>
<td>Session 1</td>
<td>50</td>
<td>43.64 ± 9.8 kg*</td>
</tr>
<tr>
<td>Session 2</td>
<td>169</td>
<td>42.15 ± 8.3 kg* **</td>
</tr>
</tbody>
</table>

*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

43.18 ± 8.73 kg (26-69)

40.48 ± 8.15kg (25-59)

(rs[219]=-.126, p=0.63).

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• Grip Strength and Deftac
  • 41% (n=70) failed

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(rs[169]=-0.227, p=0.03)

43.68 ± 8.36 kg (25-67)
40.00± 7.73kg (28-62)
Grip strength is associated with marksmanship and defensive tactics, but not injuries, in police recruits.

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• Grip Strength and Marksmanship

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

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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)
Deftac findings
- Supports subjective reports by officers
- Influenced by technique?
Marksmanship findings
- Supports findings of majority of research
  - (Anderson & Plecas, 2000; Copay & Charles, 2001; Vercriynssen, 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.

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• 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.
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)
• Grip strength measures

Greater synergy than current protocol

Different length-tension relationships of forearm musculature

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• Marksmanship measures points based
  → marksmanship based on DCOT, Xd, Yd.

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ACKNOWLEDGEMENTS

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REFERENCES

• Vercrnyssen, M., Christina, R. W., Muller, E., & Grose, E. M. (1988). Relationship of strength and precision in shooting activities.
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