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

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\textsuperscript{2}New South Wales Police Force, Sydney, Australia.
**Question:** How important is grip strength in police?

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<thead>
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<td>32*~</td>
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</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

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

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INTRODUCTION

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

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

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• **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
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
• **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

Grip strength is associated with marksmanship and defensive tactics, but not injuries, in police recruits. The correlation coefficient is $rs[219]=-0.126$, $p=0.63$.

**Handgrip Strength**

- 43.18 ± 8.73 kg (26-69)
- 40.48 ± 8.15 kg (25-59)
RESULTS

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

43.68 ± 8.36 kg (25-67)

40.00 ± 7.73 kg (28-62)

(rs[169]=-.227, p=0.03)

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RESULTS

• Grip Strength and Marksmanship
  • 12% (n=21) failed

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• Grip Strength and Marksmanship

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(rs[169]=-.419, p<0.001)
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?

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Marksmanship findings

- Supports findings of majority of research
  - (Anderson & Plecas, 2000; Copay & Charles, 2001; Vercrnyssen, 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.
• 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)

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• Grip strength measures

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

The men and women of the NSW Police Force for their service and their assistance in this research.


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