Self-reported load carriage injuries in Australian regular army soldiers

Rob Orr
Bond University, rorr@bond.edu.au

Rodney Pope
Bond University, Rodney_Pope@bond.edu.au

Julia Coyle
Charles Sturt University

Venerina Johnston
University of Queensland

Follow this and additional works at: http://epublications.bond.edu.au/tru_conf

Part of the Military Studies Commons, and the Occupational Therapy Commons

This work is licensed under a Creative Commons Attribution-No Derivative Works 4.0 License.

Recommended Citation

http://epublications.bond.edu.au/tru_conf/12

This Conference Paper is brought to you by the Tactical Research Unit at ePublications@bond. It has been accepted for inclusion in Tactical Research Unit Conference papers by an authorized administrator of ePublications@bond. For more information, please contact Bond University's Repository Coordinator.
Self-reported load carriage injuries in Australian Regular Army soldiers

Orr RM¹, Pope R¹, Coyle J², Johnston V³

1 Bond University, Gold Coast
2 Charles Sturt University, Albury
3 University of Queensland, Brisbane

Background

• Soldiers are required to carry heavy loads on military operations (often 60+kg)  
  (Orr et al., 2015)

• These loads have been found to cause injuries over a given load carriage event and over a longer period  
  (Orr et al, 2014; Reynolds et al. 1999; Knapik et al. 1992)
Aims

- **Aim:**
  - To profile load carriage injuries sustained by soldiers over their careers
Participants

• Australian Regular Army soldiers from Corps with high exposure to load carriage (selected via purposive sampling):
  – Royal Australian Infantry
  – Royal Australian Artillery
  – Royal Australian Engineers
  – Royal Australian Armoured Corps, and
  – Royal Australian Corps of Signals.
Methods

• All personnel posted to the selected units at the time of this study were invited to participate subject to the following inclusion criteria:
  – 1) a member of the ARA,
  – 2) posted to one of the selected units, and
  – 3) in full time service.
Results

• A total of 380 personnel commenced the online survey

• Completion rate was 88% (n=333), partial completion rate was 1% (n=5), and ‘break off’ rate was 11% (n=42)

• This provided a total of 338 personnel data sets for analysis
  – 34% (n=116) reported at least one load carriage injury over their military career (9.4±7.4 years of service) of which 8% (n=9) were female and 92% (n=107) were male
Results

• Female soldiers reported 1.21 (CI 0.71 to 2.04) times as many injury incidents per capita as males.

• Of the 42% (n=49) of injured soldiers who reported sustaining more than one injury...
  – 43% (n=21) reinjured the same body site
  – 31% (n=15) suffered a subsequent injury to a different site, and
  – 27% (n=13) both reinjured the same site and suffered an injury to a different site
Results

<table>
<thead>
<tr>
<th></th>
<th>Training</th>
<th>1st 12 months in Unit</th>
<th>Post 12 months in Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>TOTAL</strong></td>
<td>56</td>
<td>20</td>
<td>40</td>
</tr>
<tr>
<td>1st reported load carriage injury</td>
<td>18</td>
<td></td>
<td>31</td>
</tr>
<tr>
<td>2nd reported load carriage injury to the same person</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3rd or 4th reported load carriage injury to the same person</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Shows groups which contributed to successive injuries</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

194 total injuries.
Results

![Graph showing body site injuries with percentages and counts for different body parts.]

- **Head**: 1 (1%)
- **Shoulder**: 15 (8%)
- **Arms - Lower**: 1 (1%)
- **Arms - Upper**: 2 (1%)
- **Back - Upper**: 7 (4%)
- **Back - Lower**: 2 (1%)
- **Abdomen**: 3 (2%)
- **Hip**: 20 (10%)
- **Leg - Upper**: 46 (24%)
- **Leg - Lower**: 30 (16%)
- **Ankle**: 22 (11%)
- **Foot**: 13 (7%)

*Body Site*
Results

- Bones/Joints: 76 (39%)
- Ligaments: 29 (15%)
- Muscle/Tendons: 70 (36%)
- Other: 12 (6%)
- Skin: 7 (4%)

Body Location
Results

No sig diff when compared to Reported LC Injuries
Chi Squared p=0.31
(Orr et al, 2014)
Discussion

- Reasonably consistent with the figures reported for military load carriage events in US military forces.
  (Reynolds et al. 1999; Knapik et al., 1992)

- Corresponds with injury body site findings within both specific load carriage studies and studies of general military training suggesting consistency across contexts of load carriage, as well as across time.
  (Jennings et al., 2008; O’Connor, 2000; Almeida et al., 1999)
Discussion

• The lower back was associated with a substantial proportion of reported injuries (23% of all injuries).

• Given the biomechanical impacts of load carriage on the spine, such as increased lumbar compression and shear forces, changes to thoraco-pelvic rhythm and increased forward lean, the high proportion of lower back injuries was not unexpected.
Conclusion / Take Home Message

• Soldiers are required to carry loads as part of their occupation and these loads may predispose them to injuries
• Once injured soldiers are at an increased risk of subsequent load carriage injuries
• When treating a soldier (or other tactical personnel) for musculoskeletal injuries, developing load carriage resilience prior to return to work is a priority
References

References