Musculoskeletal fitness as a predictor of injury during police academy training: A retrospective cohort study

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Musculoskeletal fitness as a predictor of injury during police academy training

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Introduction

- Tactical training institutions (like those for military, law enforcement and firefighting) often implement intensive training regimes to adequately prepare their candidates (Bullock et al. 2010)
- Recruit training physical fitness assessment items are performed to determine baseline fitness of each recruit
- Previous research has investigated fitness measures as a positive injury predictor among tactical recruits during basic training (Bedno et al., 2013; Knapik et al., 2001; O’connor et al., 2011; Rosendal, et al., 2003)
- However protocols generally include aerobic fitness as part of the process with predominantly military recruit populations (Lisman, et al. 2013: Knapik et al., 2001)
Aim

To investigate using the push-up, vertical jump and grip strength tests as a valid musculoskeletal fitness measure for predicting injury during police academy training.
Methods

• Retrospective cohort study
• Non-identifiable data provided from 219 police recruits, covering a period from January 2013 to December 2013
• Inclusion criteria;
  – >18 years
  – Recruit able to complete all areas of fitness assessment
  – No existing injuries at commencement of fitness assessment
• Ethics approved by Bond University HREC, Protocol Number RO1898
Methods

• Fitness testing:
  – Police Physical Training Instructors conducted all of the standardised academy PU, GS and VJ assessments and were unaware of the research
  – The assessments were performed in a single session by all recruits
• Injuries recorded over 12 weeks for each recruit
• Recorders and data processors blinded
• Stats: Backwards linear regression, indep. sample t tests and spearman’s correlations
Results

Over 12 weeks of recruit training, of the 219 Police recruits:
- 26% (n=56) injured
- 74% (n=163) non-injured

Backwards linear regression showed a significant (p<0.001) relationship between combined scores for PU, VJ height GS and injury ($R^2 = .112$)

Most predictive variable was push ups ($R^2 = .110$). **Lowest scoring group >7 times as likely to sustain injury** compared to highest scoring group
Results: injury vs PU score

Percentage of Recruits injured, by PU score, with 95% CI

Spearman’s rank-order correlation between injury status & PU score:

$$r_s = -0.348, p < 0.001$$

*bins in quartile ranges
Results: *injury* vs VJ height

Percentage of Recruits injured, by VJ height, with 95% CI

Spearman’s rank-order correlation between *injury* status & VJ height:

\[ r_s = -0.224, \ p = 0.001 \]

*bins in quartile ranges*
Results: *injury* vs GS score

Percentage of Recruits injured, by GS score, with 95% CI

Spearman’s rank-order correlation between *injury* status & GS score:

\[ r_s = -0.138, \ p = 0.042 \]

*bins in quartile ranges*
Discussion

• PU, VJ and GS scores were significantly associated with injury risk

• Musculoskeletal strength and power is a known occupational requirement for Police officers

• Findings by Knapik et al. (2001) and Butler et al. (2013) are in agreement showing a correlation between low PU scores and incidence of injury for army and firefighting recruits respectively

• In agreement with our findings Orr et al. (2016) showed significant correlation between low VJ height and risk of injury
IMPLICATIONS FOR PRACTICE

• Musculoskeletal health and fitness is vital for new recruits wishing to commence police recruit training.

• Therapists treating police recruits undergoing training need to ensure their musculoskeletal rehabilitation and reconditioning is optimised prior to a return to training in order to increase their chance of training success.
References


References


Questions

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