If They Are Not Fit, They Risk Injury: The use of Fitness Testing Results to Predict Injury in Police Recruits

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If They Are Not Fit, They Risk Injury: The Use of Fitness Testing Results to Predict Injury in Police Recruits

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Presentation Outline

- Introduction
  - Brief overview of literature
- Methods
  - Study design, data, analyses
- Results
  - Main findings
- Practical Application

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Introduction

- **Occupational Profile**
  - Dynamic physically demanding tasks [2]
  - Unpredictable environment [3]
  - Resilience to span a career
- **Fitness Standards**
  - Ensuring physical readiness for police work[4]
- **Training injuries**
  - Sudden change in physical activity level[5]
- **Reducing attrition**
  - Cost[6]
  - Shrinking application pool[7]

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Literature Overview

- Largest systematic review and analysis of its kind[1]
  - 27 studies from seven countries
  - Military, LEO, and FBI populations represented
- Main Findings
  - Organization training practices, local conditions and mission profile all dictate different physical fitness needs for success
  - Fitness will usually predict injury

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Methods

Design

- Retrospective cohort
- Population: NZ Police College recruits classes from 2014-2017
- PAT: 2.4km run, vertical jump, push-up, grip strength
- Incomplete training records were excluded
- Near misses were not considered
- Injury definition
    - Musculoskeletal or peripheral nervous system injuries only

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Methods

The Physical Ability Test (PAT)

- Performed at least twice for all trainees: once for selection, and again before traveling to the RNZ Police College for training
- 2.4km run
  - Self paced event with time given every 200m
  - Level, outdoor track
- Vertical Jump
  - Standing reach height recorded first
  - 3 trials, best of three with either hand recorded
- Push-ups to Exhaustion
  - No time limitation to allow for complete muscle failure
- Grip Strength
  - Right, Left and summed measurements

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Methods

Statistical Analysis

- Data were distributed non-normally
  - Mann-Whitney U tests
- Performance quintile testing
  - Spearman's correlation
  - Cliff's delta

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Results

2.4km Run

- Not a statistically significant predictor of injury

Pushups

- Significant predictor of any injury, but not of a specific injury type
- P = 0.01, Rho = -0.166

Vertical Jump

- Significant predictor of lower limb injury only
- P = 0.03, Rho = -0.15

Grip Strength

- Predictive of trunk injury and of any injury
- P = 0.04-0.007, Rho = -0.195-0.131

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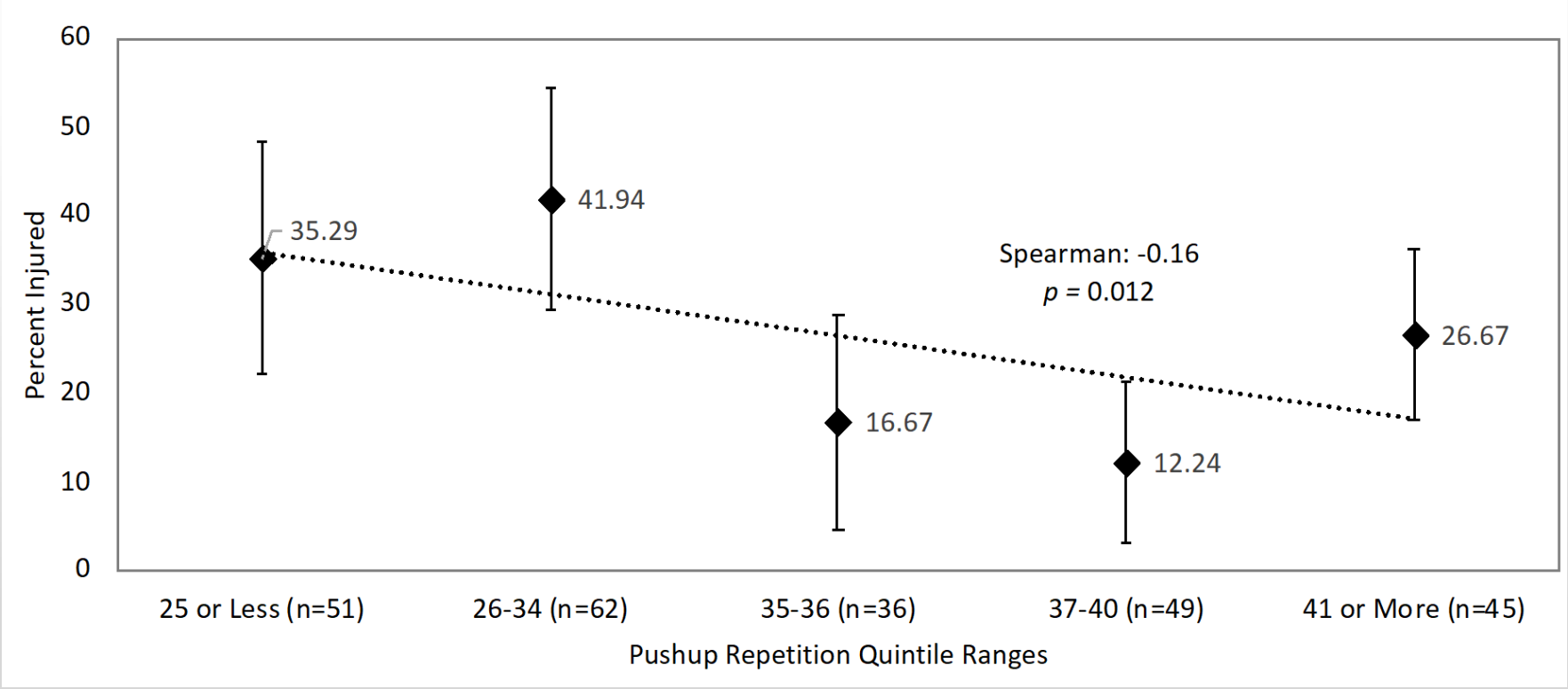
Results: Spearman's Correlation



Percentage of injured cadets within each performance quintile, push-up test

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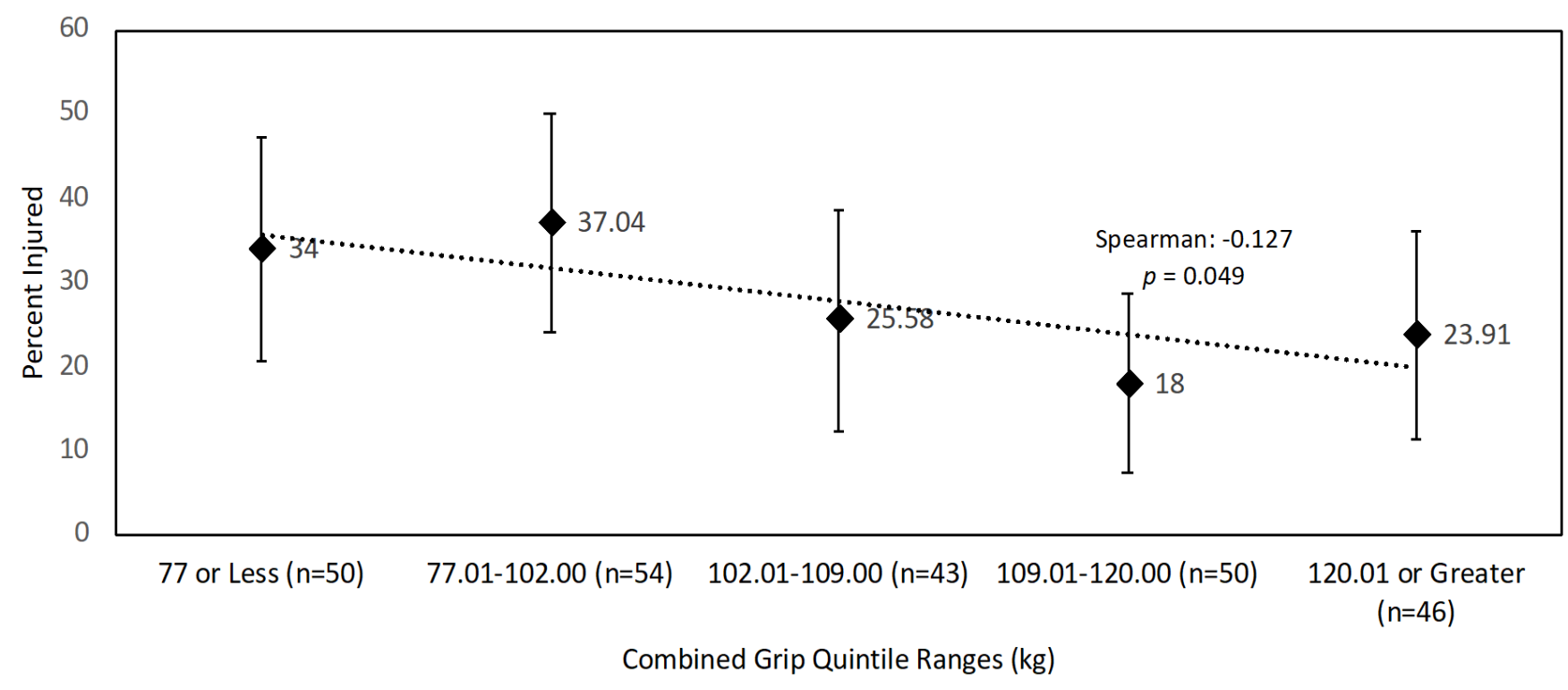
Results: Spearman's Correlation



Percentage of injured cadets within each performance quintile, combined grip strength

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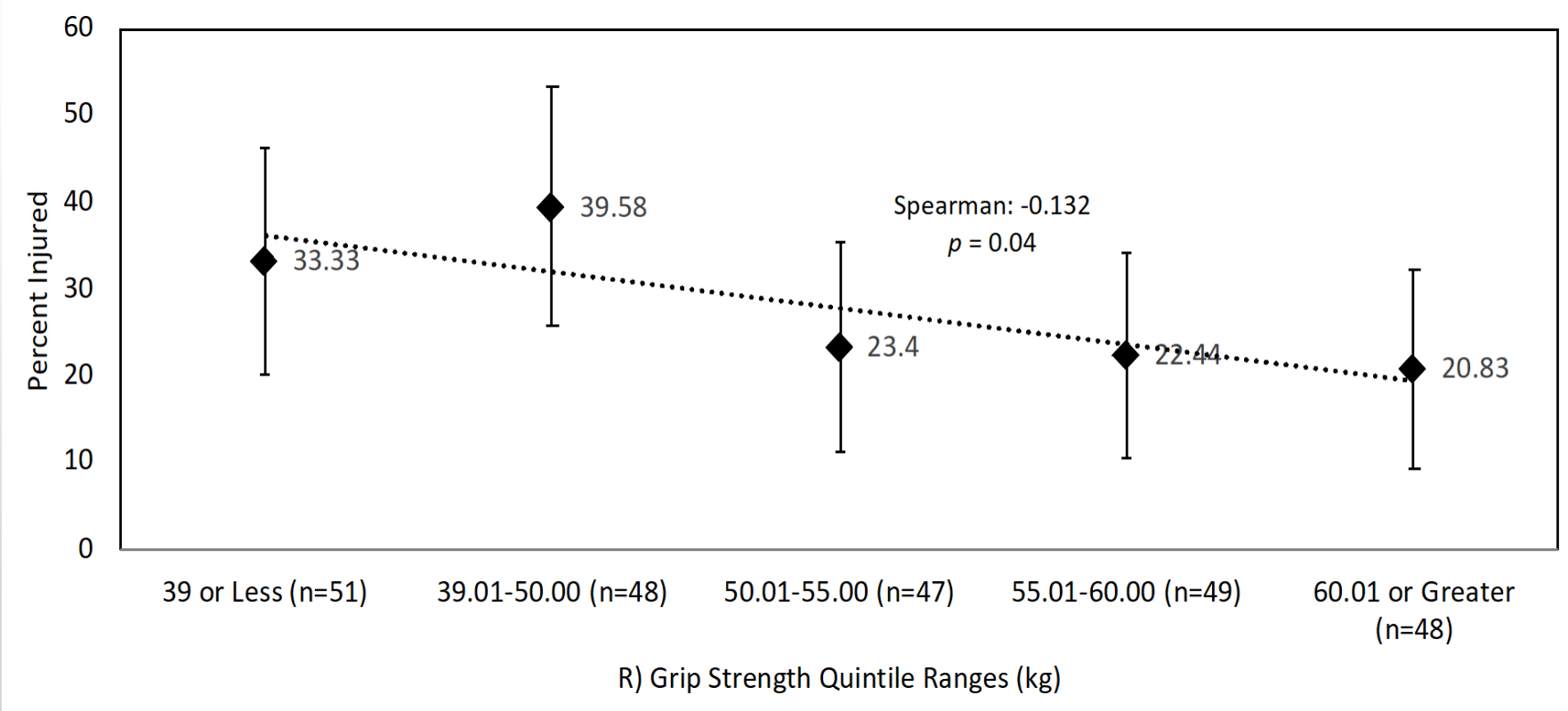
Results: Spearman's Correlation



Percentage of injured cadets within each performance quintile, right hand grip strength

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Discussion

2.4km Run

- May be an ineffective estimator of metabolic fitness in this population
  - ceiling effect
- The injury profile of our cohort may differ from that of military trainees

Pushups

- Agrees with previous research in military trainees [8]
- May be a better global muscular fitness assessment than specific for upper body

Vertical Jump

- Agrees with previous police trainee research [9]
- May effectively measure police-specific tasks; short duration, maximal exertion

Grip Strength

- Mixed results between R), L) and combined
- Generally agrees with other tactical research [10]
- May be a key component of police-specific tasks

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Conclusion

Practical Applications

- Overuse injuries are especially common
  - Training load, especially with respect to the upper limb should be monitored and graded across the training timeline
- Injuries of the upper limb are especially common in police recruits
  - Specific assessment of the upper limb, such as a pull-up may be useful
- Physical fitness testing should reflect occupational tasks
  - Distance run events may not be useful in a police context
  - Police work is often externally paced

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