INTRODUCTION

- Firefighting is associated with high rates of musculoskeletal (MSK) injury. Overexertion is the most common source of MSK injury among firefighters.
- Evaluation of how tasks are performed can identify injury risks.
- Use of video-based software can help quantify firefighter tasks, but requires accuracy despite complex movement and equipment/clothing interfering with line of sight.

OBJECTIVES

- Primary: To describe hip and knee joint motion performance while lifting a high-rise pack (HRP) from floor to shoulder.
- Secondary: To determine a) Relationship between hip joint displacement and isolated hip and knee joint angles
  b) Extent to which height and weight contribute to hip joint displacement

METHOD

- Tasks were measured as part of a larger FIREWELL study.
- Participants: 48 active firefighters including 42 males and 6 females
- Data extraction: Dartfish® program using angle tracking and positional coordinates

RESULTS

- Arc of motion
  = Maximum angle - Minimum angle
- Height normalized displacement (%) = Max. – Min. displacement / individual height × 100

Regression Model

Dependent variable:

Hip vertical displacement

Y = 0.34°*knee-0.07°*hip+22.65 R² = 0.66

Y = 0.35°*knee-0.08°*hip-0.11°*weight+33.13 R² = 0.79

Dependent variable:

Normalized by height

Y = 0.18°*knee-0.04°*hip+13.36 R² = 0.62

Y = 0.18°*knee-0.04°*hip-0.09°*weight+21.98 R² = 0.77

REFERENCES


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