

INTRODUCTION

The firefighter academy prepares recruits for occupation-related tasks and demands. The strenuous nature of these tasks put firefighters at a high risk of musculoskeletal injury. Functional movement quality has previously been used to predict the risk of injury in athletic and tactical populations*; however, it is unknown how movement quality changes across the fire academy.

OBJECTIVE: The purpose of this investigation was to examine movement quality in firefighter recruits across the fire academy.

PARTICIPANTS

- 19 career firefighter recruits (1 female; age = 24.9 ± 4.3 years; BMI = 26.7 ± 3.1 kg/m²) enrolled (Table 1).

METHODS

- Participants visited the laboratory at the beginning (week 1), midpoint (week 15), and end (week 30) of a firefighter academy
- Following a practice trial, participants performed 5 double leg overhead squats and 5 single leg squats on each leg
- The double leg squat was performed with feet shoulder-width apart and arms extended vertically above the head. Participants squatted to maximal, comfortable knee flexion and returned to the starting position.
- The single leg squat was performed by standing on the test foot with the non-weight bearing leg flexed 90° at the knee, 45° at the hip, and hands on the hips.
- Movements were recorded with digital video and analyzed with commercially available software. Compensations made during each movement were denoted and subtracted from 100 to determine the ME score.
- A mixed model approach and compound symmetry covariance structure were used to examine separate one-way repeated measures analysis of variance to determine potential changes in movement quality throughout the academy.

METHODS

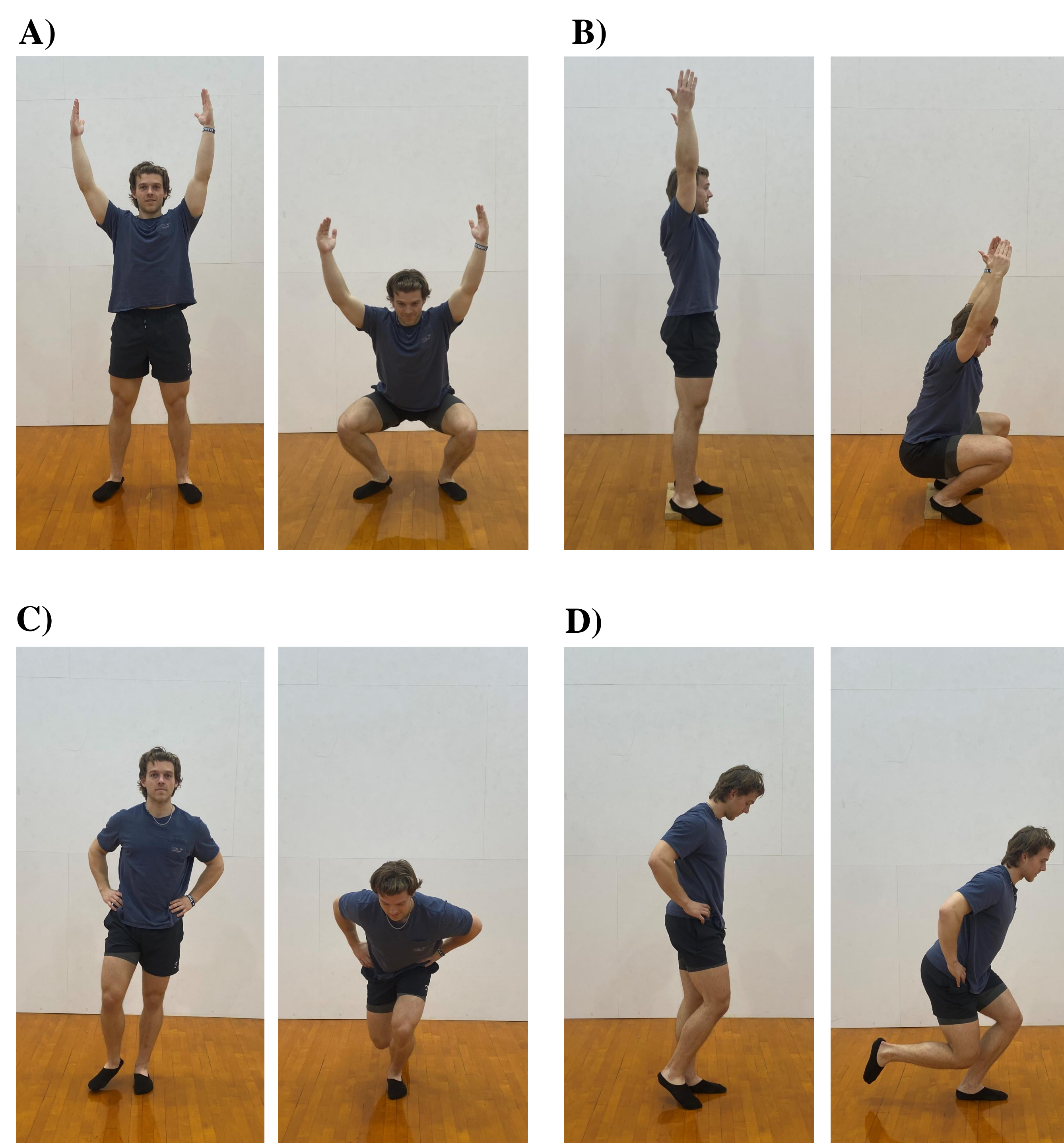


Figure 1. Examples of subtests including the: A) double leg squat at the start and end position (front view), B) double leg squat with heel lift at the start and end position (side view), C) single leg squat at the start and end position (front view) and D) single leg squat at start and end position (side view).

RESULTS

The mean \pm SD for movement quality scores at W1, W5, and W30 were 81.7 ± 8.8 , 78.2 ± 9.1 , and 76.0 ± 6.7 , respectively. There was a significant main effect for time for movement quality ($P = 0.048$). Movement quality significantly decreased from W1 to W30 ($P = 0.015$) but there were no significant differences between W15 and the W1 ($P = 0.135$) and W30 ($P = 0.299$) testing points.

RESULTS

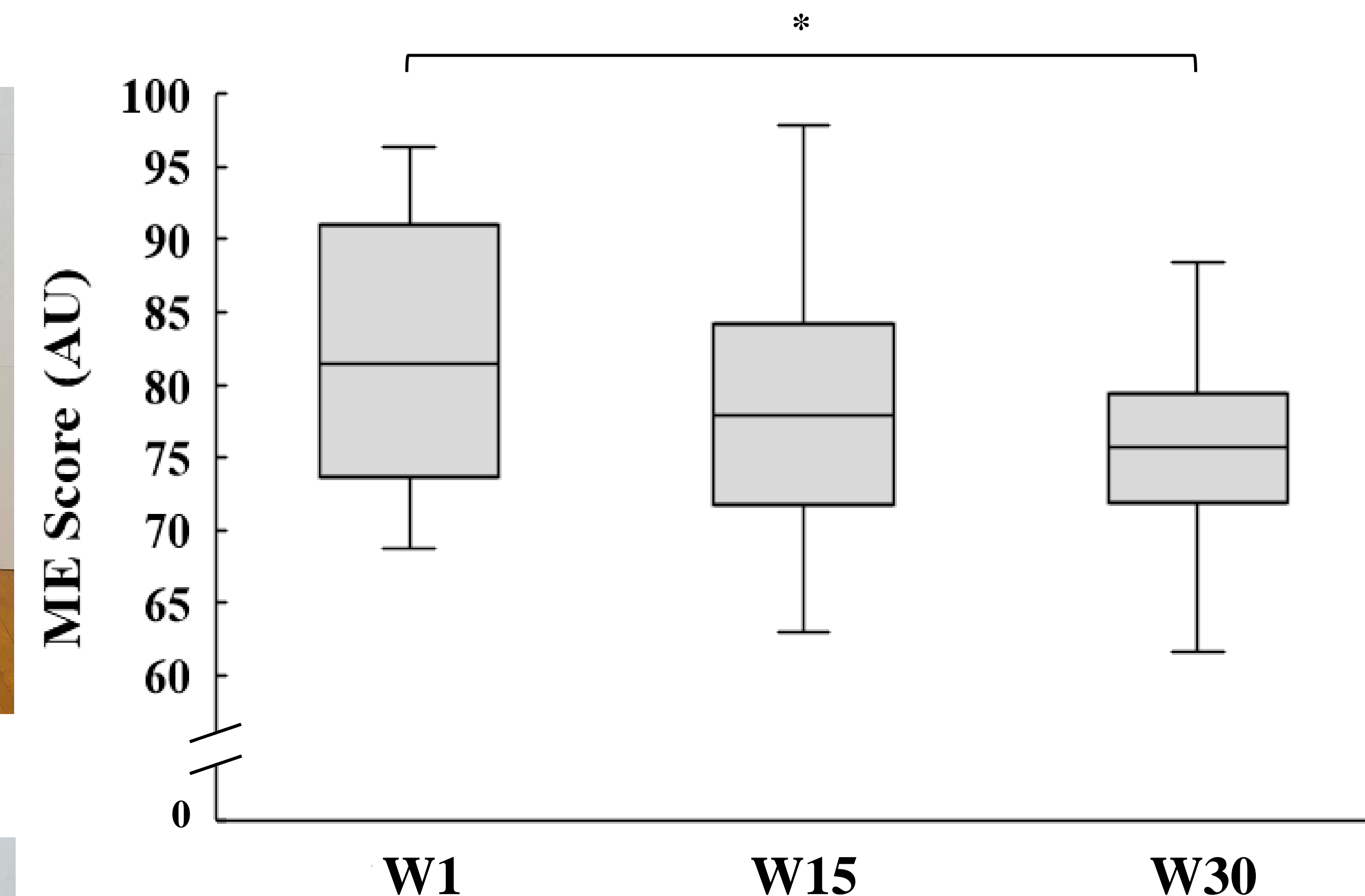


Figure 2. Box-and-whisker plot for movement quality at W1, W15, and W30. Median values are marked with the line within the boxes. The lower and upper boundaries represent the 25th (Q1) and 75th (Q3) percentiles. The lower and upper whiskers represent (Q1 - [1.5 * Interquartile Range]) and (Q3 + [1.5 * Interquartile Range]), respectively.

CONCLUSION

The findings of this study indicate that movement quality worsened in recruits from W1 to W30.

PRACTICAL APPLICATION

The decrease in movement quality across the fire academy may put firefighters at a higher risk of musculoskeletal injury as they transition into their active-duty careers. These findings may be helpful for fire administrators and tactical strength and conditioning professionals who provide fire academy training recommendations. However, future studies are needed to determine what may cause movement quality decrements across the fire academy.

REFERENCES

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