

Changes in physical training and injury incidence following Army Combat Fitness Test field testing

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Introduction

Injuries among Active-Duty Soldiers adversely affect the US Army at tactical, operational, and strategic levels. Musculoskeletal injuries comprised 81% of all injuries in the U.S. Army in 2021, with 70% of injuries associated with cumulative microtrauma. Injuries among active-duty Soldiers significantly impact mission readiness, career progression, and medical care delivery.

In 2012, the U.S. Army Training and Doctrine Command undertook a comprehensive study of baseline physical fitness related to military task performance, providing the foundation for the Army Combat Fitness Test (ACFT). The newly created ACFT assesses military-relevant physical demands (e.g., muscular strength and power, agility, and aerobic capacity) using a testing battery to measure health-related physical and skill-related combat fitness parameters. From October 2018 to April 2020, an ACFT pilot program was conducted across the U.S. Army. At the time of this investigation, the ACFT was comprised of six events: three-repetition maximum deadlift, standing power throw, hand release push-up, sprint-drag-carry, leg tuck, and timed 2-mile run.

The shift to a multi-component fitness test theoretically requires changes in physical fitness training to prepare Soldiers for the new testing battery. If not properly employed, changes in physical training to meet new physical fitness standards could result in increased injury incidence.

This investigation aimed to measure unit and personal physical training changes during ACFT field testing in active-duty operational Soldiers.

Second, we sought to determine injury incidence by body region, type, activity, and cause following ACFT field testing.

Methods

This observational investigation was designed to assess 61 operational battalions during a pilot phase (field testing) of the ACFT implementation. Operational battalions were selected by the U.S. Army Training and Doctrine Command and chosen as representative of typical U.S. Army units. McNemar tests evaluated differences between categorical variables. Paired t-tests assessed differences between continuous variables.

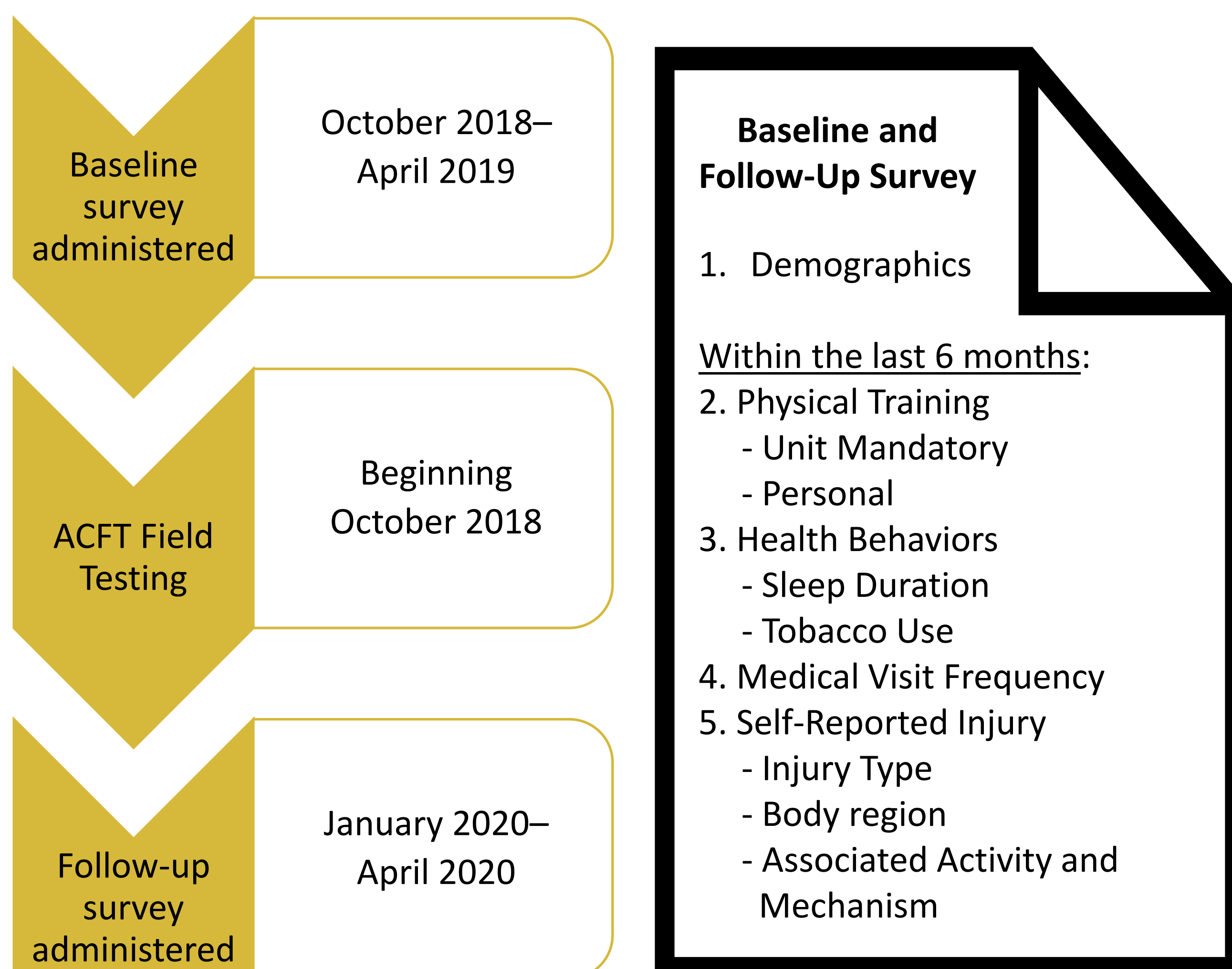
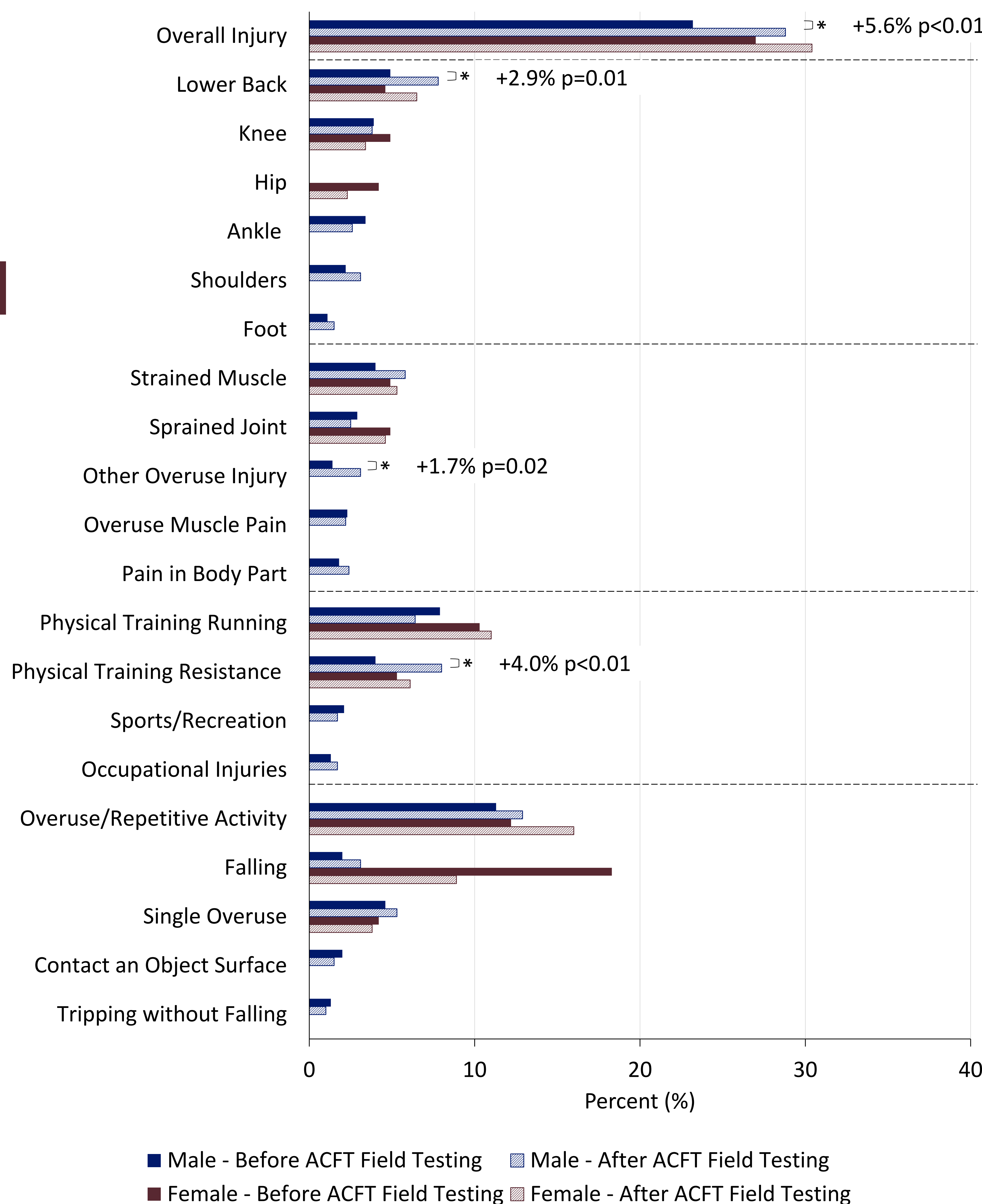


Table 1. Respondent Characteristics

	Males (n = 871)		Females (n = 263)	
	Before ACFT Field Testing	After ACFT Field Testing	Before ACFT Field Testing	After ACFT Field Testing
Age (years)	31.3±8.6	32.4±8.6 *	30.0±7.8	30.9±7.7 *
Height (inches)	70.2±3.3	70.0±2.8 *	65.4±3.5	65.1±2.8
Weight (pounds)	185.5±27.4	188.3±27.2 *	146.7±20.9	148.3±21.1 *
Body mass index (kg/m ²)	26.4±3.3	27.0±3.2 *	24.1±3.1	24.6±2.9
Estimated Body Fat (%) ¹	21.3±4.3	21.9±4.0 *	31.3±4.9	32.0±4.4 *
Sleep duration (hours)	6.1±1.1	6.0±1.2 *	6.3±1.1	6.2±1.3
Cigarette Smokers (%)	11.0	12.3	3.8	4.2

Figure 1. Leading injured body regions, injury type, activity type, and injury mechanism²



Results

Figure 2. Unit Physical Training Activities
Males n = 389, Females n = 88

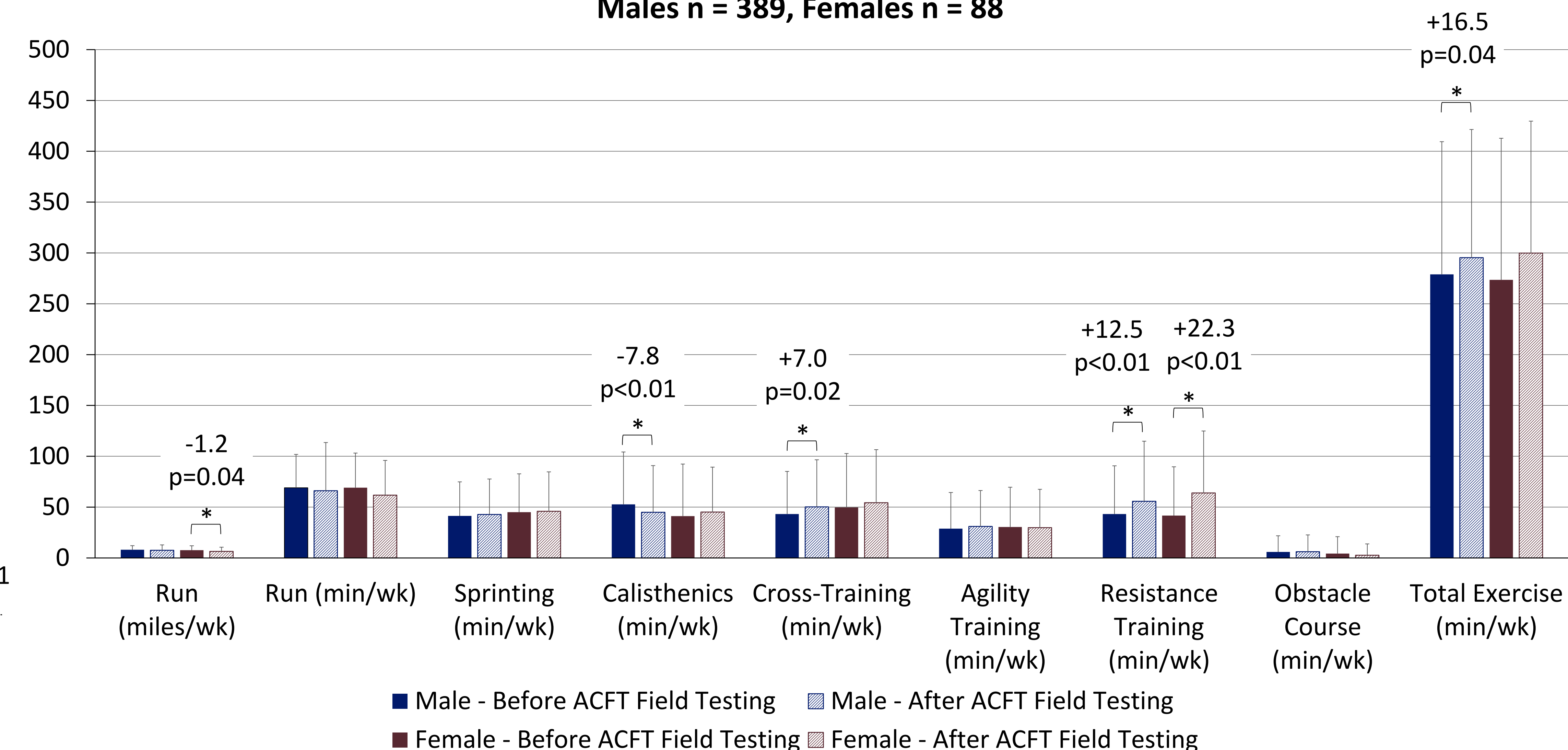
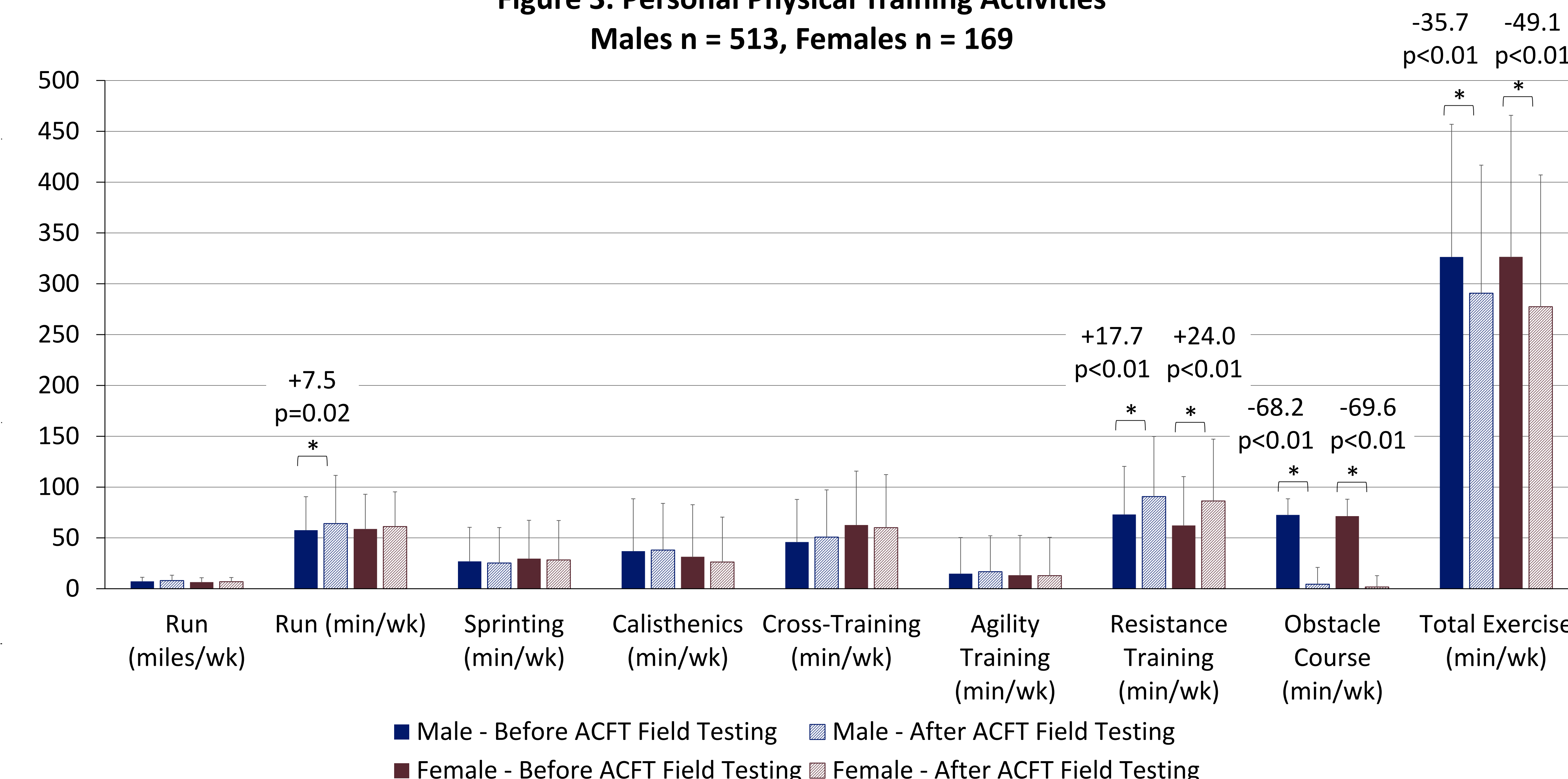


Figure 3. Personal Physical Training Activities
Males n = 513, Females n = 169



Conclusions

- Introduction of a new physical fitness test resulted in increased resistance training and changes in total exercise time.
- Overall, lower back and other overuse injuries increased for males.
- Changes in physical training may lead to changes in activities associated with injury.

References and Footnotes

- 1) Gallagher D, et al. Healthy percentage body fat ranges: an approach for developing guidelines based on body mass index. Am J Clin Nutr. 2000;72(3):694-701.
 - 2) Top leading body parts, types and mechanism among all Soldiers (male n = 871, female n = 263). Activity and mechanism percents calculated for cause-coded injuries only.
- * p < 0.05 (Table 1)