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Relationship Between the U.S. Army Combat Fitness Test and Motion Capture Outcomes

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Muscular fitness and functional movement capacity are important in military testing because they allow an individual to use muscular strength and power through full range of motion. DARI Motion Capture is a portable, markerless system that quickly assesses full body mobility and performance abilities. The DARI has not been used to test performance variables in the U.S. Army Combat Fitness Test (USACFT). **PURPOSE:** To examine relationships between the DARI assessment and USACFT in ROTC Cadets. **METHODS:** 17 (3 females, 14 males) Army ROTC Cadets aged 19.5 ± 0.9 years participated in the study. Two weeks elapsed between the USACFT (3 RM Deadlift, Standing Power Throw, Hand Release Push-Ups, Sprint-Drag-Carry, Plank, and 2-mile run) and the DARI assessment. Athletic performance was assessed using nine movements from the DARI: shoulder abduction, shoulder horizontal abduction, shoulder internal and external rotation, shoulder flexion and extension, trunk rotation, bilateral squat, lateral lunge, vertical jump, and single leg multi hop. Pearson Correlations were used to assess relationships between the various USACFT assessments and the power-based movements from the DARI assessment. **RESULTS:** The 3 RM Deadlift showed moderate relationships with Vertical Jump Bilateral Peak GRF ($r=0.536$, $p=0.026$), Vertical Jump Bilateral Net Impulse ($r=0.616$, $p=0.008$), and Vertical Jump Positive Impulse ($r=0.607$, $p=0.010$). The Standing Power Throw showed moderate relationships with Vertical Jump Bilateral Net Impulse ($r=0.736$, $p=0.001$), Vertical Jump Bilateral Positive Impulse ($r=0.738$, $p=0.001$), and Vertical Jump Bilateral Peak GRF ($r=0.593$, $p=0.016$). **CONCLUSION:** Moderate relationships were shown between various USACFT and DARI assessments. Motion capture systems can pick up on performance variables that are present in military testing. Therefore, the DARI assessment may be used to help individualize exercise prescriptions to improve performance on the USACFT. **SIGNIFICANCE/NOVELTY:** DARI Motion Capture is a new system, and the relationship between performance measures and military specific assessments is unclear.