SWACSM Abstract

How does body composition predict the performance of ROTC cadets on the ACFT

ANNIKA GRAMS, RUTH LARSON, PAYTON PRICE, SOFIA HARMAN, SARA THOMASSON, KAITLYN WABAKKEN, KATELYNN BROCK, ZACHARY ZEIGLER, & ANTHONY ACEVEDO

POWER Lab; Exercise Science; Grand Canyon University; Phoenix, AZ

Category: Undergraduate

Advisor / Mentor: Acevedo, Anthony anthony.acevedo@gcu.edu

ABSTRACT

The Army Combat Fitness Test (ACFT) is a newly developed test assessing U.S. Army soldiers' combat readiness. Body composition characteristics vary between soldiers and could affect performance outcomes. The purpose of this cross-sectional study is to determine whether fat-mass and fat-free-mass can predict performance outcomes of the ACFT in ROTC cadets. **Methods:** ROTC cadets (31 males, 21 females; aged 20.5 ± 2.2 years) completed the 6-event ACFT (3-repetition maximum trap-bar deadlift [MDL], standing power toss [SPT], hand-release pushups [HRPU], sprint-drag-carry shuttle run [SDC], plank [PLK], and 2-mile run [2MR]). The cadets were invited into the laboratory for measurements of anthropometrics (height, weight, and body mass index [BMI]) and body composition analysis via the air displacement plethysmograph (body fat mass [BFM], fat-free mass [FFM]). The ability of body composition to predict ACFT performance was determined with a linear regression model. Significance was set at $p < 0.05$. **Results:** BFM was significantly and negatively correlated to SDC ($r = -.383$, $p = .005$), PLK ($r = -.567$, $p < .001$), 2MR ($r = -.577$, $p < .001$), HRP ($r = -.501$, $p < .001$) and overall ACFT score ($r = -.574$, $p = .001$) except 3DL ($r = .199$, $p = .154$) and SPT ($r = -.193$, $p = .166$). FFM was significantly correlated to SDC ($r = .411$, $p = .001$), PLK ($r = .249$, $p = .047$), 3DL ($r = .266$, $p = .034$), SPT ($r = .458$, $p = .001$), and overall ACFT score ($r = .364$, $p = .003$) except 2MR ($r = .137$, $p < .279$) HRP ($r = .126$, $p = .322$). BFM significantly explained 33% ($p = .001$) of the variance on the total ACFT scores with a beta coefficient -4.632. **Conclusion:** Body composition measurements of BFM and FFM are predictors of the ACFT total score. These data show that both BFM and FFM are important metrics for assessing a soldier's combat readiness. For every 1% increase in body fat, ACFT scores decreased by 4 points. For every 1kg increase in FFM, ACFT score increased by 1.5 points.