



Physical Fitness Status of ROTC cadets

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Abstract

Army Reserved Officer's Training Corps (ROTC) cadets undergo weekly physical training to prepare for the tactical aspects of a military career. According to the National Physical Activity Plan (NPAP, 2020), only 41% of adults 17-24 years old are prepared for military training. Physical fitness characteristics of ROTC cadets is important to determine their readiness for a military career. **PURPOSE:** The purpose of this study was to determine the physical fitness status of ROTC cadets. **METHODS:** Forty-eight ROTC cadets from Eastern Michigan University (EMU) (37 males and 11 females; 21.4± 3.3 years old) were recruited to participate in this study. Participants came to the Running Science Laboratory at EMU on two separate occasions. Visit 1 consisted of descriptive measurements including age, height, and weight. Participants also completed physical fitness testing including seven site skinfolds to determine percent body fat, grip strength, vertical jump, and the agility t-test. Visit 2 consisted of a VO_{2max} test on a treadmill (25 males and 10 females). The VO_{2max} test involved participants running at a self-selected pace while grade increased 2% every 2 minutes until volitional exhaustion. Mean and standard deviation were calculated for descriptive and physical fitness measurements. Age corrected and sex specific norms were used to categorize percent body fat, highest grip strength recorded, vertical jump, and VO_{2max} (ACSM, 2022). **RESULTS:** Male participants (82.4±11.3 kg, 178.1±8.0 cm) had a VO_{2max} of 48.1±5.9 ml/kg/min (50th; Fair), body fat of 17.4±5.5% (45th; Fair), grip strength of 47.0±9.9kg (75th), and vertical jump of 54.9±8.9cm (Very Good). Female participants (71.6±11.6kg, 164.5±6.4cm) had a VO_{2max} of 39.6±4.3 ml/kg/min (55th; Fair), body fat of 28.2±5.0% (20th; Poor), grip strength of 35.0±7.1kg (95th), and vertical jump of 36.1±6.9 cm (Very Good). Males and females scored 12.0±1.5s and 14.0±1.7s on the agility t-test, respectively, which are below those reported for recreational athletes (Stewart, 2014). **CONCLUSION:** Results of the current study are consistent with previous literature that ROTC cadets have average physical fitness compared to age and sex corrected norms (Thomas, 2004; Oliver, 2017). **PRACTICAL APPLICATIONS:** Given the nature of a military career and requirements of army physical fitness testing, results of this study suggest that more attention towards improving physical fitness should be implemented in weekly physical training.

Introduction

• According to the National Physical Activity Plan (2020) only 41% of adults 17-24 years of age are prepared for military training. The physical fitness of ROTC cadets is important to determine their readiness for a career in the military upon commissioning.

• Assessing results of the Army Combat Fitness Test (ACFT) in conjunction with laboratory measurements allows for a comprehensive measurement of readiness.

• The ACFT is a more demanding physical test than its predecessor, the Army Fitness Test. Therefore, laboratory measurements are significantly more important to measure readiness of the cadet.

Purpose

• To determine the physical fitness status of ROTC cadets

Methods

Participants:

- Forty-eight (37 males and 11 females; 21.4± 3.3 years old) ROTC cadets from Eastern Michigan University (EMU) participated in the study
- Informed consent, physical readiness questionnaire (PAR-Q+), and a health history were obtained prior to testing
- The study was approved by the University Human Subjects Review Committee at EMU.

Procedures:

- Participants visited the Running Science Laboratory at EMU on two separate occasions
- Age, height, and weight were determined during the first visit.
- Participants then completed a battery of physical fitness tests starting with seven site skinfolds to determine percent body fat.
- Following skinfold measurements, participants completed three additional tests: grip strength, vertical jump, and the agility T-test.
- Visit 2 consisted of a VO_{2max} test on a treadmill. Thirty five participants (25 M, 10 F) returned for Visit 2. The VO_{2max} test involved participants running at a self-selected pace while grade increased 2% every two minutes until volitional exhaustion.

Statistical Analysis

- Mean and standard deviation were calculated for descriptive and physical fitness measurements
 - Age corrected and sex specific norms were used to categorize percent body fat, highest grip strength recorded, vertical jump, and VO_{2max} (ACSM, 2022)
- Results
- Table 2 Physical Fitness Test Results
 - Same columns as above with data from VO_{2max} , skinfolds, grip strength, and vertical jump

Male Participants:

- (82.4±11.3 kg, 178.1±8.0 cm) had a VO_{2max} of 48.1±5.9 ml/kg/min (50th; Fair)
- Body fat of 17.4±5.5% (45th; Fair)
- Grip strength of 47.0±9.9kg (75th)
- Vertical jump of 54.9±8.9cm (Very Good)

Female Participants:

- (71.6±11.6kg, 164.5±6.4cm) had a VO_{2max} of 39.6±4.3 ml/kg/min (55th; Fair)
- Body fat of 28.2±5.0% (20th; Poor)
- Grip strength of 35.0±7.1kg (95th)
- Vertical jump of 36.1±6.9 cm (Very Good)

- Males and females scored 12.0±1.5s and 14.0±1.7s on the agility t-test, respectively, which are below those reported for recreational athletes (Stewart, 2014)

Conclusions

- Results of the current study are consistent with previous literature that ROTC cadets have average physical fitness compared to age and sex correlated norms of the general population (Thomas, 2004; Oliver 2017)
- When comparing the ROTC cadets to the correlated norms of the general population and given the nature of a military career and requirements of the new Army Combat Fitness Test, **weekly physical training should be implemented for all cadets**

Strengths

Limitations

- Not all participants that completed Visit 1 returned to complete the VO_{2max} test during Visit 2
- No follow up testing was conducted prior to initial testing

Acknowledgments

- EMU graduate students that assisted with data collection for this study.
- The Eastern Michigan University ROTC and Military Science Department.

References

- National Physical activity Plan 2020
- ACSM Guidelines 2020
- Stewart, 2014
- Thomas, 2004; Oliver 2017

