

FAT FREE MASS INDEX AND FAT MASS INDEX VALUES IN POLICE CADETS UNDERGOING CADET TRAINING

Michael Lane, Annette DeLage, Christopher Perry, Greyson Shouse, Zachary Hash
 Department of Parks, Recreation, Exercise and Sports Science, College of Health Sciences, Eastern Kentucky University

INTRODUCTION

- Body composition is an important component for both physical performance and long-term health outcomes.
- The Body mass index is flawed for a variety of reasons but examining the fat mass index and fat free mass index are more important for health and performance utilizing the same formula but now accounting for the different types of tissue.
- Low enforcement officers have physically demanding jobs where body composition is influential and is important for their long-term health.
- Getting good baseline information as to typical cadet body composition is useful information for helping to maintain performance over their career.

PURPOSE

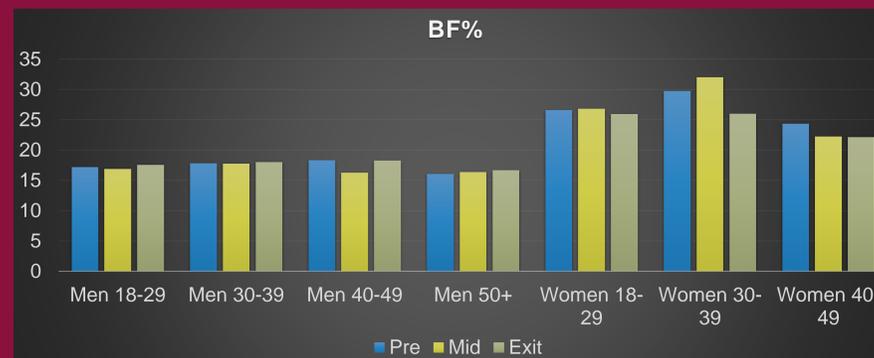
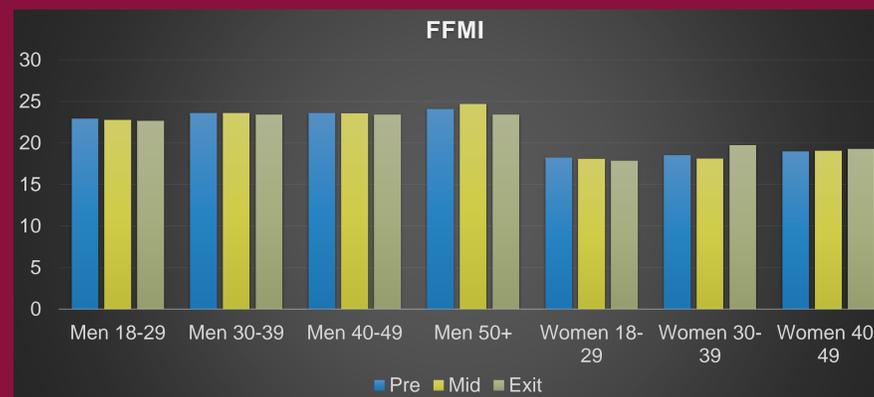
- To examine the fat mass index and fat free mass index of cadets going through law enforcement officer training.

METHODS

- 2051 cadets undergoing police training were measured throughout their training for body composition via Tanita scanner.
- Measurement for the cadets when at the midpoint of their training was utilized for this analysis (week 10 of training)
- Body fat and lean body mass values were recorded and heights measured by stadiometer.
- Data was analyzed for fat free mass index and fat mass index utilizing FM and FFM values from the Tanita scan utilizing typical equations for the metrics.
- Data was then analyzed overall and by age groups and gender for descriptive statistics.
- An ANOVA was performed to examine the differences in all metrics within each gender by Age group (alpha was set at < .05 for significance). LSD post hoc testing was performed to analyze for group differences.

RESULTS & DISCUSSION

- Overall there were 1409 cadets between 18-29 years old (YO), 474 between 30-39 YO, 140 between 40-49 YO, and 38 that were 50+ YO but only male.
- The data overall is enclosed in the table and figure below.
- There were no significant differences between the age groups in each gender for any metric.
- There was high variability in all metrics for the cadets, specifically in the younger cadets.



CONCLUSIONS

- Although the BMI of the cadets was overweight on average, the lean body mass was higher with the average body fat being in the normal range for both genders.
- This fact was observed over each of the age groups as well.
- The values observed in this study are considered healthy for long term health, which should not be misconstrued as optimal for athletic performance.
- Further research examining how these values change over training and then throughout their policing career should be performed.
- Additionally, how these metrics effect performance and injury risk should be investigated.
- The method used to measure body composition in this study has inherent flaws and utilizing more modalities and doing regional analyses is also worth pursuing in future investigation.

PRACTICAL APPLICATIONS

- Police cadets undergoing training have higher body weight relative to their height (overweight through BMI), but a significant amount of that is through lean body mass which is beneficial for performance and long-term health.
- Each age group had similar FFMI and FMI even though aging typically causes a decrease in FFMI and an increase in FMI.
- This is likely due to the fitness requirements in order to become a law enforcement officer.
- cursory analysis did not show a great change in FFMI or BF% over the course of cadet training, further analysis should examine relative changes in individuals due to cadets at either end of the spectrum might see a pseudo regression to the mean.

REFERENCES

- Filip Kukic a,*, Milivoj Dopsaj b, Aleksandar Cvorovic a, Milos Stojkovic c, Velimir Jeknic c. A brief review of body composition in police workforce. International Journal of PHYSICAL EDUCATION, FITNESS AND SPORTS 2018
- Filip Kukic1; Aleksandar Cvorovic1; J. Jay Dawes2; Nenad Korpanovski. BODY MASS INDEX DIFFERENCES OF POLICE CADETS AND POLICE EMPLOYEES Bio-medical aspects of Physical Activity
- Crawley, Amy A.1; Sherman, Ross A.2; Crawley, William R.3; Cosio-Lima, Ludmila M. Physical Fitness of Police Academy Cadets: Baseline Characteristics and Changes During a 16-Week Academy. Journal of Strength and Conditioning Research 30(5):p 1416-1424, May 2016. | DOI: 10.1519/JSC.0000000000001229

ACKNOWLEDGEMENTS

The authors are grateful for the continued relationship with the DOCJT, their instructors and cadets. Additionally, the authors would like to thank Roy Merritt for his contributions

| | Total number in range (n) | Age Range (years) | Height (m) | Weight (kg) | Body Fat Percentage (%) | Body Mass Index (kg/m ²) | Fat Free Mass Index (kg/m ²) | Fat Mass Index (kg/m ²) |
|--------------|---------------------------|-------------------|------------|-------------|-------------------------|--------------------------------------|--|-------------------------------------|
| men | 1298 | 18-29 | 1.79±.09 | 89.2±16.0 | 17.2±6.4 | 28.2±9.4 | 23.1±7.4 | 5.1±2.8 |
| | 459 | 30-39 | 1.79±.08 | 92.7±14.6 | 17.8±5.6 | 28.8±3.9 | 23.5±2.5 | 5.4±2.4 |
| | 133 | 40-49 | 1.79±.08 | 92.2±13.4 | 17.7±4.6 | 28.9±4.3 | 23.7±2.7 | 5.2±2.0 |
| | 38 | 50+ | 1.79±.11 | 93.1±12.4 | 16.2±4.1 | 29.6±6.7 | 24.7±5.3 | 5.0±1.8 |
| women | 111 | 18-29 | 1.64±.08 | 67.2±12.1 | 26.4±7.6 | 24.9±3.6 | 18.1±1.4 | 6.8±2.9 |
| | 15 | 30-39 | 1.64±.10 | 71.8±9.1 | 29.5±9.1 | 26.7±2.3 | 18.7±1.9 | 8.0±2.9 |
| | 7 | 40-49 | 1.63±.03 | 66.1±10.6 | 23.1±3.2 | 24.9±3.8 | 19.1±2.3 | 5.8±1.6 |