

Association of Body Composition Methods and Occupational Readiness: Differences between Veterans and Rookies

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ABSTRACT

The increasing prevalence of obesity among United States firefighters has prompted concerns. Current guidelines from National Fire Protection Association 1582 rely on *body mass index (BMI)* for obesity assessment. However, BMI's inability to distinguish between fat and lean mass raises validity issues. An alternative measurement, *body fat percentage (BF%)* has emerged as a potentially more accurate tool for assessing obesity. Moreover, the widely used *Physical Ability Test (PAT)* may face complexities in evaluating firefighters' readiness due to variations in *body composition (BC)* among individuals. Additionally, the combined influence of years in service, BC variations, and the aforementioned factors could potentially impact PAT performance and, consequently, firefighters' overall readiness. **PURPOSE:** To examine whether differences exist in obesity categorization when using BMI compared to BF% and how these measurements affect the performance of *rookie (R)* and *veteran (V)* firefighters in the PAT. **METHODS:** Sixty-two male firefighters were analyzed, categorized per *American College of Sports Medicine (ACSM)* and *World Health Organization (WHO)* guidelines. Veteran status was determined by having more than one year of experience. Firefighters underwent full gear PAT assessments on separate days. Log-linear and linear modeling, with Obese as the reference for BMI and BF%, and R for experience, were used. Age was controlled in linear modeling. Statistical analysis was conducted in Jamovi version 2.4.8, with significance set at $p < 0.05$. **RESULTS:** Categorical modeling was significant, highlighting the impact of years of experience, BF%, BMI, and the interaction between BF% and BMI ($\chi^2_{29} = 78.34$, $p < 0.001$). The continuous PAT model also showed significance, with significant differences observed in years of experience, BMI, and BF% ($F_{8,53} = 5.02$, $p < 0.001$, $R^2 = 0.43$). **CONCLUSION:** This study supports previous work from our laboratory and highlights the ongoing debate surrounding the use of BMI in assessing obesity among firefighters. It emphasizes the potential disparities between BMI and BF% categorization and their impact on firefighters' performance in the PAT, shedding light on the complex relationship between body composition, years of experience, and occupational readiness.