TACSM Abstract

Evaluating a Fire Department's Conditioning Program's Ability to Predict Tactical Performance from Physical Fitness Testing

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ABSTRACT

Firefighters' (FF) physical fitness (PF) levels affect their ability to carry out daily tasks and meet unforeseen emergencies. Fire departments (FD) design simulations via the *physical ability test* (PAT) as an occupational-specific metric of PF. PAT is used both in recruitment and as an indicator of FFs' on-going PF. However, PATs are labor-/time-/cost-sensitive. Could PF tests reveal recruits' level of conditioning and predict PAT scores in frugality? **PURPOSE**: Identify relationships between selected PF components' scores and PAT performance on City of Hialeah's Fire Department's (HFD) specific PAT. **METHODS**: Forty-five FF (age 26±5SD) performed a battery of PF tests assessing body composition (BF%), cardiorespiratory endurance (1½ mile run), upper-body muscular endurance (pullups, pushups, situps). A timed PAT of nine consecutive events (stair climb, hoist evolution, forcible entry, hose advance, victim-mannequin drag, ladder carry/climb, extrication exercise, confined space crawl) performed to assess tactical performance. Same PF tests repeated following a non-customized 8-week conditioning program. Linear regressions for PAT (Y) and PF tests (X's) at pre- and post-conditioning period performed to explore relationships and create the pre-/post-prediction models. T-test performed on unstandardized coefficients to compare the pre-post models (SPSS©, $p < 0.05$). **RESULTS**: Pre-PAT significantly correlated with pre-PF: BF% (r=.4, p=.004), 1½ mile (r=.54, p<.001), pullups (r=-.4, p=.009), pushups (r=-.5, p<.001). Post-PAT significantly correlated with post-PF: BF% (r=.31, p=.02), pullups (r=-.4, p=.002), pushups (r=-.4, p=.003). PF tests significantly predicted Pre- (R^2=.45, $F_{5,39}$=6.4, p<.001) and Post-PAT (R^2=.26, $F_{5,39}$=2.7, p=.03). Pre-PAT model was significantly higher than the Post-PAT regression model (t_{44}=4.5, p<.001). **CONCLUSION**: HFD's selected PF tests are significantly correlated with PAT and contributed to the models' predictive power. Identifying PF components that, not only condition individuals for the PAT, but also predict performance, could be useful for recruits/FFs and officers, respectively. Administrators need to re-evaluate current conditioning practices to better serve the FFs. Future modeling may need to include skilled-related PF tests.