Relationships between the 1.5-mile Run and Multi-stage Fitness Test in Deputy Sheriff Recruits Post-Academy Training
Hernandez, Javier; Moreno, Matthew R.; Balfany, Katherine; Dulla, Joseph; Dawes, Jay J.; Orr, Rob Marc; Lockie, Robert G.

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ABSTRACT

The most popular method for measuring aerobic fitness within US law enforcement agencies (LEA) is the 1.5 mile run (1.5 mi run). A limitation of the 1.5 mi run test is that it does not discriminate between physiological components of aerobic fitness. Therefore, the introduction of a multi-stage fitness test (MSFT) is an indication of the need for such a system. The purpose of this study was to analyze the test-retest reliability of LEA recruits and officers, and in a normally distributed data set, this study examines whether correlation between 1.5 mi run and MSFT. More specifically, this study used Pearson’s correlation coefficient (r). The results include the following:

• The 1.5 mi run reliability on 10% of the mean.
• While in the line of duty, the primary job task of a deputy sheriff is primarily sedentary (e.g., sitting in a patrol vehicle, office work). However, increases in movement intensity can be required during patrol that could ensure a deputy’s safety, or the safety of the general population. Since the MSFT is externally paced, it more closely matches the demands of a deputy, as opposed to the 1.5 mi run. As a result, the MSFT could present itself as a more appropriate test of aerobic fitness.
• Academy training is used to prepare recruits for the rigors of duty and to enhance physical fitness. If training approaches are successful during academy, aerobic fitness as measured by the 1.5 mi run and the MSFT should be relatively similar, in that recruits should be aerobically fit and have the high-intensity running capacity to perform well in both tests.2,12
• The purpose of this study was to analyze the relationship between the 1.5 mi run and the MSFT of deputy sheriff recruits at the end of academy.

METHODS

• Retrospective analysis was conducted on five academy classes of one LEA.
• This sample comprised of 261 recruits (age: 26.59 ± 5.06 years; height: 1.74 ± 0.08 m; body mass: 81.38 ± 14.77 kg), which included 227 males (age: 26.63 ± 5.19 years; height: 1.76 ± 0.07 m; body mass: 83.40 ± 13.34 kg) and 34 females (age: 26.26 ± 4.12 years; height: 1.63 ± 0.07 m; body mass: 67.94 ± 16.90 kg).
• The 1.5 mi run and MSFT were conducted in the last few weeks of the recruit's 22-week academy. Time was recorded for the 1.5 mi run while total shuttles were recorded for the MSFT. Estimated maximal aerobic capacity (VO2max) was calculated from both tests. Estimated from the aforementioned tests was compared with paired samples tests. Pearson’s correlations and linear regression scatter plots calculated relationships between the 1.5 mi run and MSFT. Each was analyzed separately, with p<0.05 set for all analyses. The VO2max, calculated from the 1.5 mi run, was significantly greater than those for the MSFT for both males (47.04 ± 10.26 ml/min/kg) and females (31.9 ± 4.5 ml/min/kg). The r values were calculated with the regression equations for males (r= 0.23) and females (r= 0.35). The results indicate that a good correlation exists between both tests (1.5 mi run and MSFT). These results should prove useful in identifying unfit recruits and officers, with greater inter-test reliability, internal consistency, externally paced running. Since the job demands of a deputy sheriff are externally paced by nature, this outcome is not ideal. Academy training programs should use the evaluation of evidence-based high-intensity running programs.

RESULTS

• The VO2max calculated from the 1.5 mi run were significantly greater than those for the MSFT for both males (47.04 ml/kg/min vs. 40.88 ml/kg/min; Figure 1) and females (43.16 ml/kg/min vs. 37.02 ml/kg/min; Figure 2).
• The r values from the regression equations for males (0.24), and females (0.10) were both low.

CONCLUSIONS

• The results suggest that recruits performed relatively better in the 1.5 mi run compared to the MSFT. Their physical training program tended to emphasize calisthenics, interval running circuits that lacked evidence-based work: rest ratios, and distance running; this could have impacted these results.1,2,11
• This could indicate that even with any aerobic fitness improvements, high-intensity running capabilities, which are particularly stressed in the MSFT, could be limited. Indeed, the weak relationships between the tests, especially for females, would suggest recruits still have limitations in high-intensity, externally paced running.
• As previously mentioned, the 1.5 mi run may not accurately match the job demands of a deputy sheriff. The 1.5 mi run allows the recruits to set their own pace, and has limited high-intensity components.2 Considering the fact that the MSFT has external pacing and a more pronounced high-intensity component,10 this test may be a better fit to indicate career preparations for a deputy sheriff recruit.
• Since the job demands of a deputy sheriff are externally paced by nature, the outcomes shown from the data in this study is not ideal. Academy training programs should explore the use of evidence-based high-intensity running programs.

REFERENCES