Long, Hot Summer: A Preliminary Investigation of Seasonal Variations in the Physical Fitness Performance Of Law Enforcement Recruits in Southern California

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Published: 01/10/2018

Document Version:
Peer reviewed version

Link to publication in Bond University research repository.

Recommended citation(APA):
Long Hot Summertime: A Preliminary Investigation of Seasonal Variations in the Physical Fitness Performance Of Law Enforcement

Rural Interns in Southern California

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ABSTRACT

Law enforcement agencies (LEA) conduct physical testing to assess readiness of recruits prior to academy training. The LEA in this study used a test battery called the Validated Physical Ability Test (VPAT+) on set dates during the year, typically performed outdoors. Warmer ambient temperatures can negatively affect physical performance via increased heat stress and decreased time to muscular fatigue (2, 4). The purpose of this study was to determine whether seasonal differences in temperature impact LEA recruit performance in their VPAT+ test battery. Analytical methods involved descriptive statistics and comparison of resultant data on physical performance and temperature to LEA's pre-established performance standards. Significant differences were found between the seasons in specific VPAT+ tests, and the descriptive data is displayed in Table 1. For the push-ups, WIN and SUM performed 16% and 19% significantly better than SPR. In the SUM, SUM performed 18% better than FALL. When comparing the groups, a one-way ANOVA was used with a Bonferroni post hoc (p = 0.05). For the push-ups, the detrimental effect on performance due to heat stress and reduced evaporative capacity was possible because air temperature and humidity increase (p < 0.05). It was noted that variability in VPAT+ performance across the seasons could be due to class-to-class fitness variations in recruits. However, WIN was significantly better in the SUM, which is a maximal running test. Warmers can increase cardiovascular strain, while humidity can decrease sweat evaporation rates. Both factors can result in an increased rate to fatigue and poorer performance on the MSFT. Additionally, activities have been shown to be greatly influenced by hot environments as a result of increased skin temperature, which decreases cardiac output (4). For the push-ups, WIN and SUM performed 16% and 19% significantly better than SPR. In the SUM, SUM performed 18% better than FALL. When comparing the groups, a one-way ANOVA was used with a Bonferroni post hoc (p = 0.05). It was noted that variability in VPAT+ performance across the seasons could be due to class-to-class fitness variations in recruits. However, WIN was significantly better in the SUM, which is a maximal running test. Warmers can increase cardiovascular strain, while humidity can decrease sweat evaporation rates. Both factors can result in an increased rate to fatigue and poorer performance on the MSFT. Additionally, activities have been shown to be greatly influenced by hot environments as a result of increased skin temperature, which decreases cardiac output (4).

CONCLUSIONS

• Warmer ambient temperatures, coupled with high relative humidity, could have negatively affected recruit performance. This was indicated by Maughan et al. (4), who found that a reduced rate of heat loss at higher levels of humidity, coupled with warmer temperatures, progressively impaired exercise capacity.

• It should be noted that variability in VPAT+ performance across the seasons could be due to class-to-class fitness variations in recruits. However, WIN was still significantly better in the MSFT, which is a maximal running test. Aerobic activities have been shown to be greatly influenced by hot environments as a result of increased skin temperature, which decreases cardiac output (4).

• Warmer temperatures can increase cardiovascular strain, while humidity can decrease sweat evaporation rates. Both factors can result in an increased rate to fatigue and poorer performance on the MSFT. Additionally, activities have been shown to be greatly influenced by hot environments as a result of increased skin temperature, which decreases cardiac output (4).

• A recruit’s performance in fitness assessments could impact possible employment. Ambient weather conditions could have a significant influence on how a recruit performs during fitness assessments, potentially playing a role in the hiring process.

• LEA staff may need to consider ambient temperatures and humidity during tests such as the VPAT+ due to possible adverse effects on recruit performance, and this is particularly true for maximal running tests.

METHODS

• Retrospective analysis was conducted on data from four classes during different environmental seasons. The environmental conditions for each season are displayed in Table 2. Ambient temperatures and humidity percentages were obtained via meteorological records (4).

• The sample included 375 recruits from one LEA.

• For the push-ups, WIN and SUM performed 16% and 19% significantly better than SPR. In the SUM, SUM performed 18% better than FALL. When comparing the groups, a one-way ANOVA was used with a Bonferroni post hoc (p = 0.05). It was noted that variability in VPAT+ performance across the seasons could be due to class-to-class fitness variations in recruits. However, WIN was significantly better in the SUM, which is a maximal running test. Warmers can increase cardiovascular strain, while humidity can decrease sweat evaporation rates. Both factors can result in an increased rate to fatigue and poorer performance on the MSFT. Additionally, activities have been shown to be greatly influenced by hot environments as a result of increased skin temperature, which decreases cardiac output (4).

RESULTS

• Significant differences were found between the seasons in specific VPAT+ tests, and the descriptive data is displayed in Table 1. For the push-ups, WIN and SUM performed 16% and 19% significantly better than SPR. In the SUM, SUM performed 18% better than FALL. When comparing the groups, a one-way ANOVA was used with a Bonferroni post hoc (p = 0.05). It was noted that variability in VPAT+ performance across the seasons could be due to class-to-class fitness variations in recruits. However, WIN was significantly better in the SUM, which is a maximal running test. Warmers can increase cardiovascular strain, while humidity can decrease sweat evaporation rates. Both factors can result in an increased rate to fatigue and poorer performance on the MSFT. Additionally, activities have been shown to be greatly influenced by hot environments as a result of increased skin temperature, which decreases cardiac output (4).

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