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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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ABSTRACT

Law enforcement agencies (LEA) conduct physical testing to assess readiness of recruits prior to academy training. The LEA in this study used a standardized test battery called the Validated Physical Ability Test+ (VPAT+) on set dates during the year. The VPAT+ consists of push-ups, sit-ups, medicine ball throw, vertical jump (VJ), arm ergometry, 75-yard pursuit run (75PR), and the multi-stage fitness test (MSFT). The purpose of this study was to determine whether seasonal differences in temperature and relative humidity impacted LEA recruit performance during their VPAT+ fitness assessment.

METHODS

• Retrospective analysis was conducted on data from four classes during different environmental seasons.
• The environmental conditions for each season are displayed in Table 1. Ambient temperatures and humidity percentages were obtained via meteorological records [4].
• The sample included 375 recruits from one LEA.

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, respectively.
• In the SPR, SUM performed 18% significantly better than WIN.

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 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 significantly better than SUM, SPR, SPR and WIN, and SPR performed significantly better than WIN, SKU, and SUM, respectively.
• Warmer temperatures can increase cardiovascular strain, while humidity may decrease sweat evaporation rates. Both factors can result in an increased rate of fatigue and poorer performance. Aerobic 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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• 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 delaying a role in the hiring process [4].

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

Table 1. Descriptive data (mean ± SD) between seasons and VPAT+

<table>
<thead>
<tr>
<th>Test</th>
<th>Fall (C)</th>
<th>SPR (C)</th>
<th>WIN (C)</th>
<th>SUM (C)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Temperature</td>
<td>22.28</td>
<td>22.28</td>
<td>22.28</td>
<td>22.28</td>
</tr>
<tr>
<td>% Humidity</td>
<td>30-30</td>
<td>30-30</td>
<td>30-30</td>
<td>30-30</td>
</tr>
<tr>
<td>% Performance</td>
<td>21-25%</td>
<td>21-25%</td>
<td>21-25%</td>
<td>21-25%</td>
</tr>
</tbody>
</table>